ENGINEERING NEWS-RECORD

A McGRAW HILL PUBLICATION

3,500,000 GALLONS

2,000,000-gal. Horton radial-cone bottom elevated tank installed in the municipal water system at Ft. Worth in 1950.

1,500,000-gal. Horton radial-cone bottom elevated tank recently installed in the municipal water system at Ft. Worth, Texas.

of new elevated storage in the Ft. Worth water system

The recently-installed 1,500,000-gal. Horton elevated steel tank and a 2,000,000-gal. Horton elevated tank erected in 1950, help make up a grand total of 5,700,000 gallons of elevated storage in the municipal water system at Ft. Worth, Texas.

Ft. Worth requires a large amount of elevated storage in separate tanks because the municipal distribution system encompasses five different pressure plane areas. To maintain adequate pressures, each area requires its own pumping station, elevated storage and distribution system. The pumping stations, however, are all supplied from one main station.

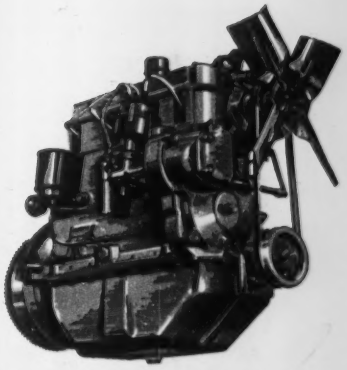
When in need of elevated storage to improve the service in municipal water systems, write our nearest office for estimates or quotations.

CHICAGO BRIDGE & IRON COMPANY

Atlanta, 3 ..... 1776 Peachtree Street
Birmingham, 1 ..... 1528 North 30th Street
Boston, 16 ..... 1613—101 Cummington Street
Chicago, 4 ..... 2161 McCormick Building
Cleveland, 15 ..... 2361 Midland Building
Detroit, 26 ..... 1506 Lafayette Building
Houston, 2 ..... 602 Akron Building
New York, 6 ..... 2165 C & I Life Building
Los Angeles, 17 ..... 1311 General Petroleum Building
Philadelphia, 3 ..... 3311—165 Broadway Building
Pittsburgh, 19 ..... 1623—1700 Walnut St., Building
San Francisco, 4 ..... 3212 Akron Building
Seattle, 1 ..... 1538—2000 Bush Street
Tulsa, 3 ..... 1312 Henry Building
1617 Hunt Building

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA. In Canada: HORTON STEEL WORKS LIMITED, FORT ERIE, ONT.

dynamic new engine gives the popular D Motor Grader increased work power



POWER CRATER Engine brings *truly modern power* to the Model D

This new engine boosts power while using less fuel per horsepower. It obtains high-octane performance when using regular gasoline. Only by watching a new Model D work can you fully realize what this truly modern engine adds to its performance!

Weight: 8,800 lb. (bare) • Brake Horsepower: 50
4 Speeds forward to 25.6 mph.
Reverse Speed 3.3 mph.

The thousands who own Allis-Chalmers Model D's know the ability of these versatile machines to do outstanding work on both construction and maintenance jobs. Now — with extra power and added features — the Model D sets even higher performance standards in the low-cost grader field.

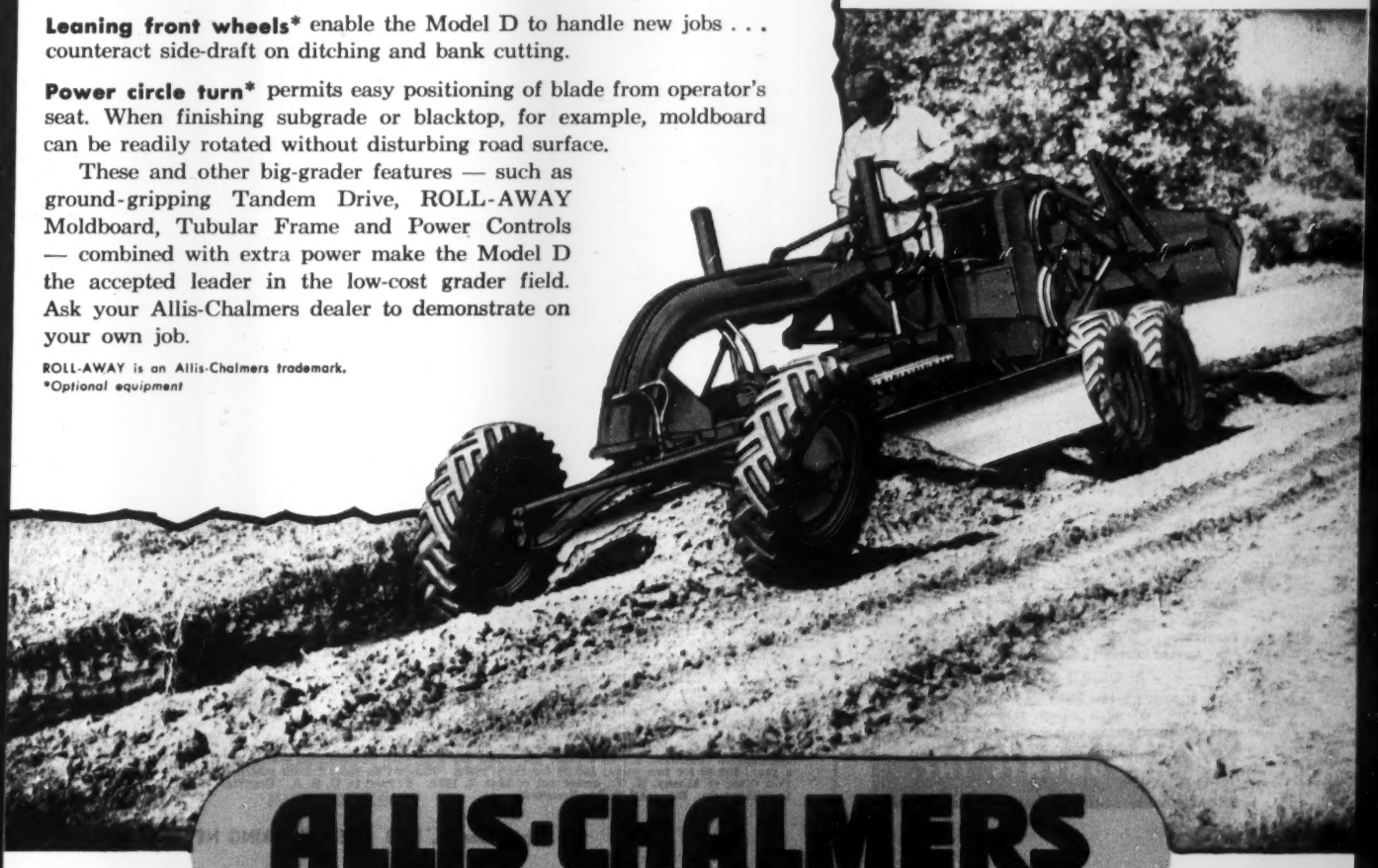
Dynamic New Power Crater Engine gives the Model D reserve power to : (1) handle the same loads in higher gear or bigger loads in the same gear, (2) increase road speeds, especially where there are grades, (3) reduce need for shifting, thus lengthen clutch life, (4) give better all-round maneuverability. There's plenty of power to crowd while loading with the rear-end loader. Engine throttles down to half speed *and still does the same job* — on low-speed work.

Leaning front wheels* enable the Model D to handle new jobs . . . counteract side-draft on ditching and bank cutting.

Power circle turn* permits easy positioning of blade from operator's seat. When finishing subgrade or blacktop, for example, moldboard can be readily rotated without disturbing road surface.

These and other big-grader features — such as ground-gripping Tandem Drive, ROLL-AWAY Moldboard, Tubular Frame and Power Controls — combined with extra power make the Model D the accepted leader in the low-cost grader field. Ask your Allis-Chalmers dealer to demonstrate on your own job.

ROLL-AWAY is an Allis-Chalmers trademark.
*Optional equipment



ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

for greater
CONVENIENCE
and
ACCURACY

LEUPOLD
Engineered
LEVELS

Advanced design engineering and precision manufacturing techniques have earned world-wide acclaim for LEUPOLD instruments since 1907. Exclusive LEUPOLD features...dependable LEUPOLD accuracy are your assurance of time-saving, trouble-free service under all working conditions.

GREATER VERSATILITY WITH 1 INSTRUMENT

- CHECKING ROAD GRADES
- TOPOGRAPHIC MAPPING
- DETERMINING TREE HEIGHTS
- GENERAL LEVELING WORK

Exclusive LEUPOLD design holds scales in milled slide, ready for immediate use without removing and reversing the frame ...saves time and trouble on all jobs. Bubble magnifier adjusts internally to the user's eye. No draw eyepiece to retract for carrying...no re-focusing each time instrument is used. New improved micrometer adjustment on index arm gives easier, faster and more accurate readings.

4 SCALES AVAILABLE

- Degrees
- Percent
- Topographic
- Chainage Corrections

Overall Length.....6½ inches
Radius of Arc.....1¾ inches
Comes in saddle leather case with bolt loop
MODEL A (Choice of any 2 scales)....$27.50
MODEL B (Choice of any 3 scales)....$30.00

Compact, lightweight instrument for all preliminary leveling work. Measures only 5¼" in overall length. Exclusive LEUPOLD bubble magnifier adjusts internally to user's eye...brighter bubble eliminates eyestrain and permits faster, more accurate readings.

Overall Length.....5¼ inches
Diameter.....¾ inch
Comes in saddle leather case $11.70

ORDER BY MAIL

or write for new literature on the LEUPOLD line of levels and compasses.

LEUPOLD & STEVENS INSTRUMENTS, INC.
3445 N. E. Glisan St., Portland 13, Oregon

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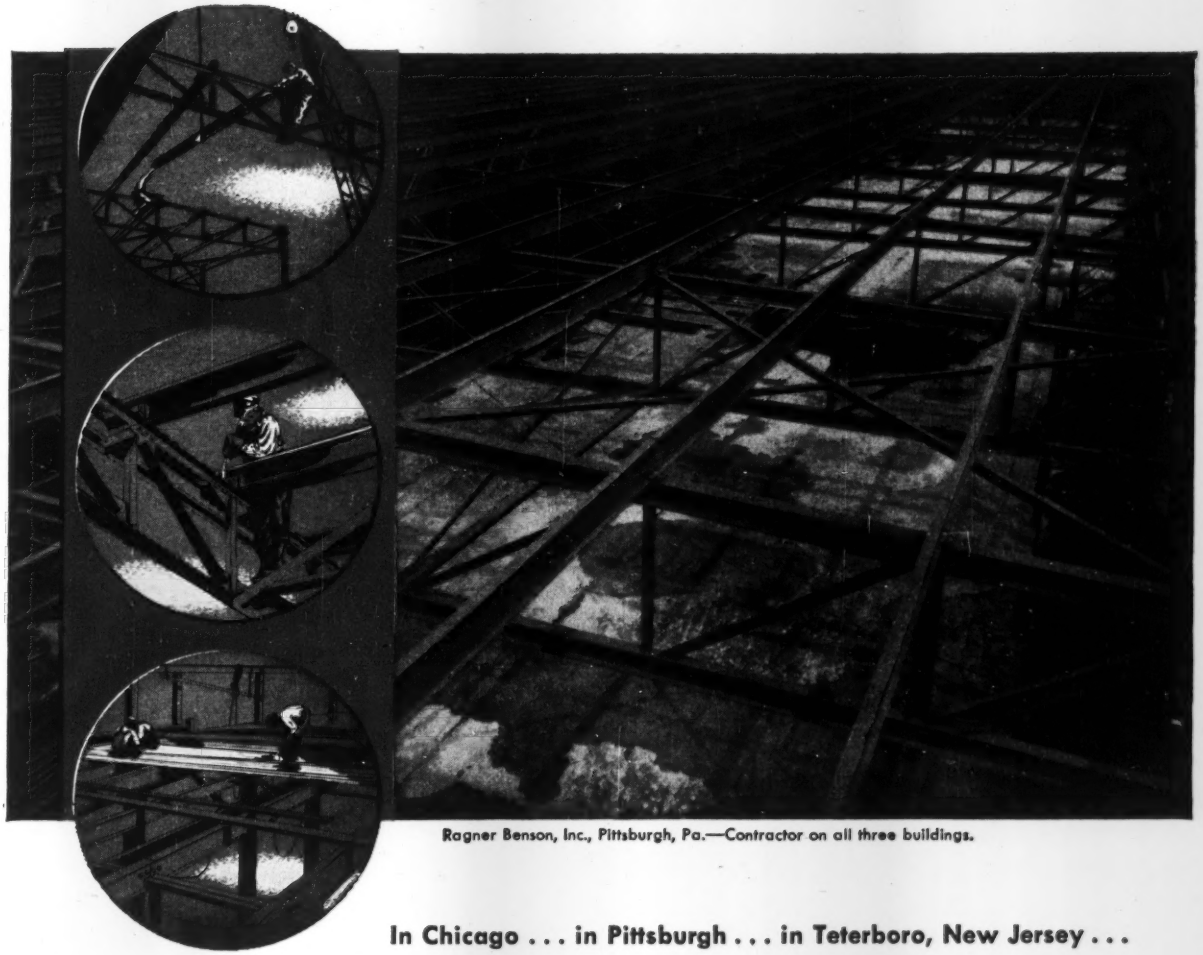

Ragner Benson, Inc., Pittsburgh, Pa.—Contractor on all three buildings.

In Chicago . . . in Pittsburgh . . . in Teterboro, New Jersey . . .

the Ford Motor Company uses

J&L JUNIOR BEAMS

Three new Parts Depots now being built for the Ford Motor Company illustrate the versatility and adaptability of J&L JUNIOR BEAMS for all types of building construction. More and more architects, builders and contractors are recommending lightweight J&L JUNIOR BEAMS to solve their design problems.

Besides fast, economical construction—JUNIOR BEAMS allow for maximum safety, permanence of construction, functionality of design—and, still maintain a low over-all cost.

You'll also be interested in these other important features offered by J&L JUNIOR BEAMS. They are:

EASY TO INSTALL	SHRINK PROOF
RIGID	FIRE PROOF
VIBRATION RESISTANT	VERMIN PROOF

and have the LOWEST DEFLECTION FACTOR OF ANY STRUCTURAL SECTION OF EQUIVALENT WEIGHT.

Write today for our new booklet covering J&L JUNIOR BEAMS AND CHANNELS. It shows how JUNIOR BEAMS are used as floor joists and roof purlins, with loading and spacing tables for various spans.

J&L STEEL

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PITTSBURGH

Jones & Laughlin Steel Corporation
428 Gateway Center, Pittsburgh 30, Pennsylvania

Please send me a copy of the booklet covering J&L JUNIOR BEAMS AND CHANNELS.

Name_____

Company_____

Address_____

_____

NEW!

EIMCO 105's are new equipment for mining, construction, quarry, tunneling, logging, oil fields, farming or any job requiring a thoroughly tough unit as a prime mover, bulldozer, or loader.

Machines are designed, usually, for a weight limit to sell at a price OR THEY ARE DESIGNED FOR SERVICE. EIMCO machines have always been designed for service — weight and price receive no consideration. The result in this case is a unit designed to give maximum life — (3 to 4 times more than ordinary equipment in the same class) — with minimum maintenance attention. Trouble free service for many years on the job.

Construction is rugged, with each piece designed for maximum loading conditions — using the most modern metallurgical research and best in tooling and equipment. Each part is processed to give it toughness and hardness in the right places.

On the EIMCO 105 you'll find no weak spots designed to produce repair parts sales. No bulk weight spots to provide "cheap beef". Every part is functional — made of steel — fabricated, or alloy steel forgings and castings. The 105 is powered to give maximum effective use of every ounce of energy applied.

See this unit in action — operate it yourself. There is nothing like it anywhere! You'll be amazed at the easy controls, the performance — the simplicity. Write for more details.

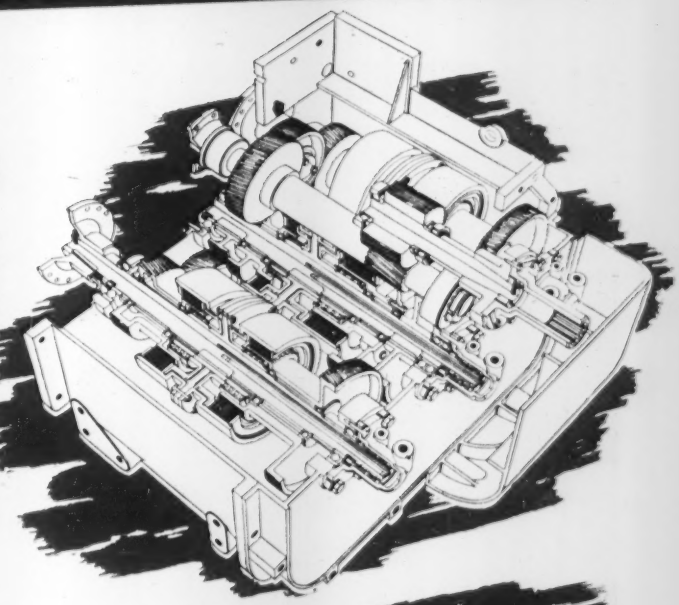
LOADER—WITH COST SAVING ADVANTAGES

NEW Eimco Transmission:

Eimco's great new Unidrive achieves supremacy in engineering advancement of tractor power transmissions.

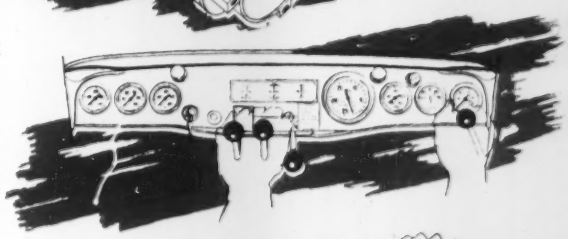
The Unidrive is a compact transmission containing in one unit all of the gearing and clutches for speed changing and full independent reversal of each tracks. Its unique design combines all of the best features of torque converter, constant mesh gearing, hydraulically actuated friction clutches and sealed oil bath, pressure lubrication of all wearing parts.

The oil-cooled, positive engagement clutches never need adjustment. The precision helical gearing is alloy steel, carefully heat-treated and micro-shaved for years of quiet operation.



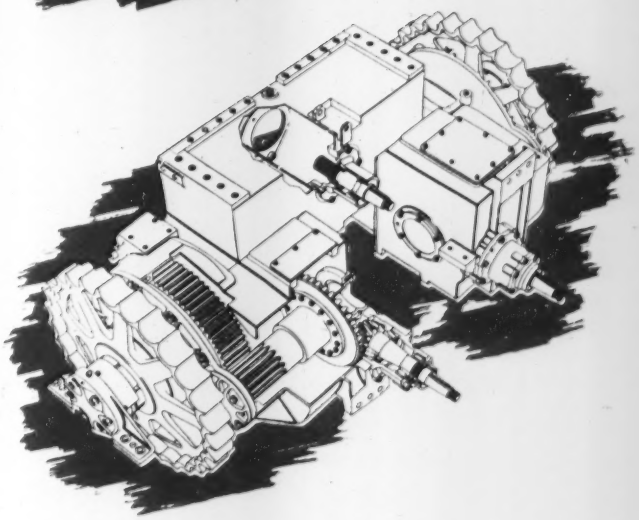
NEW Controls and Instruments:

The Eimco 105 may be operated by one hand covering two small levers. Push for forward motion, pull for reverse motion. Each lever controls the track on its respective side, a twist of the wrist starts one track in forward motion and the other in reverse for a spin turn or release one handle and it will automatically return to neutral for a gradual turn. Attachments, such as the Eimco loader can be operated by the other hand.



NEW Final Drive:

Each track is equipped with its own final drive in a cast steel case with a cast steel cover. These final drives do not house clutches or troublesome gadgets. They are sturdy heavy-duty parts carefully machined for silent operation and long service under unusually difficult job conditions.



NEW Other Features:

There are many other features in the 105 such as: instant reverse at all speeds, torque converter cushioned drive, air cooled precision disc brakes, all metallic clutch facings, full flow oil filters, force feed lubrication, adjustable digging depth stops, variable height discharge, 1½ to 2½ cubic yard buckets and many others.

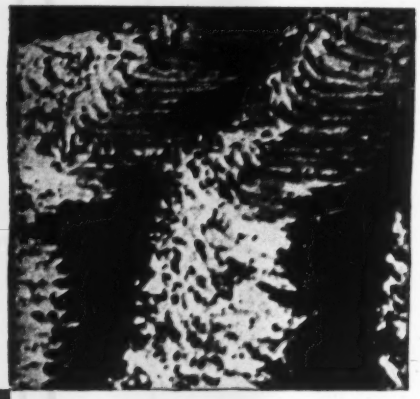
EIMCO

THE EIMCO CORPORATION

Salt Lake City, Utah, U.S.A.

Export Office: Room 2160, 52 Vanderbilt Ave., New York City

THE TRACK



OF A

Mack TELLS A

STORY OF

Power

Ever notice the ground where a Mack six-wheeled truck has passed over? No scuff marks here. The track of a Mack tells a story of unfaltering traction . . . of surefooted, relentless driving power.

The "reason why" is found in Mack's Balanced Bogie with exclusive inter-axle and inter-wheel Power Dividers that assure positive traction under the most adverse conditions. Acting normally as a true differential, the Power Divider delivers torque between the bogie axles and wheels in proportion to wheel traction, thus eliminating useless wheel slippage and spinning.

Your nearest Mack branch or distributor will show you how Mack six-wheelers can keep your big loads moving fast—no matter how tough the terrain—on dependable, time-saving, cost-cutting schedules.

Mack TRUCKS

1726

. . . Outearn Them All

Mack Trucks, Empire State Building, New York 1, N. Y. Factory branches and distributors in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.

Good water at lowest cost

Layne can help you get it

For 70 years Layne has been planning and producing efficient, economical, dependable water supply systems for municipalities, industries and farms. Layne perfected the gravel wall well. The Layne factory has produced a superior vertical turbine pump and well screen. New methods and materials are constantly being developed and proven in the laboratories of the Layne Research Division, the only organization of its kind in the world.

Undivided responsibility

When you let Layne develop or increase your water supply you save money because Layne does the whole job. From initial surveys and test drillings to completed water system and maintenance service through the years you deal with only one organization. Layne gives you dependable, economical, undivided responsibility.

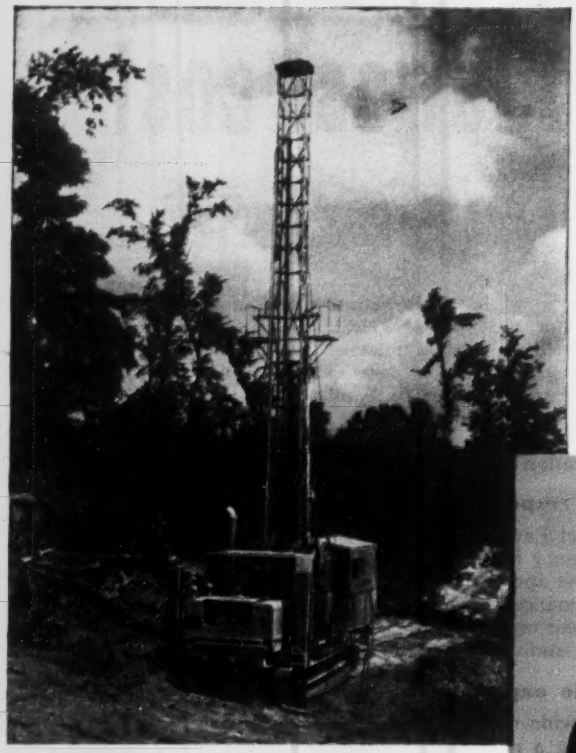
World-wide experience

Our world-wide experience can be of benefit to you . . . in developing a new water supply . . . in extending your present system . . . in achieving greater production through overhaul of your existing system.

Consult your nearest Layne Associate Company or write Layne & Bowler, Inc., Memphis 8, Tenn.

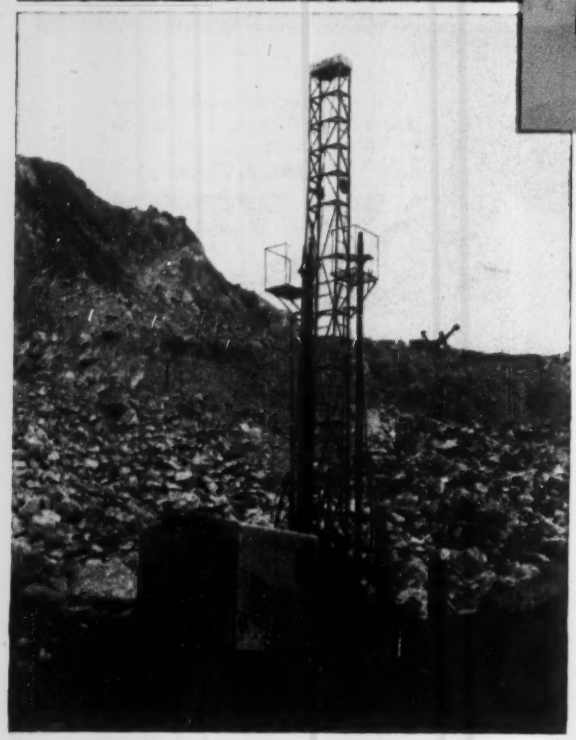
Water Wells
Vertical Turbine Pumps
Water Treatment

Layne Associate Companies Throughout The World



The machine that has revolutionized BLAST HOLE DRILLING

The JOY CHAMPION



The Joy Champion Blast Hole Drill is a continuous-type rotary drill that DRILLS DRY—you can forget water lines and all their Winter freezing problems.

Drilling is by a tri-cone roller bit which pressure-cuts the rock while a cooling air blast is forced down the drill pipe and through the bit. Cuttings are blown to the surface where they are captured—with 100% efficiency—by a new, optional, bag-type dust collector.

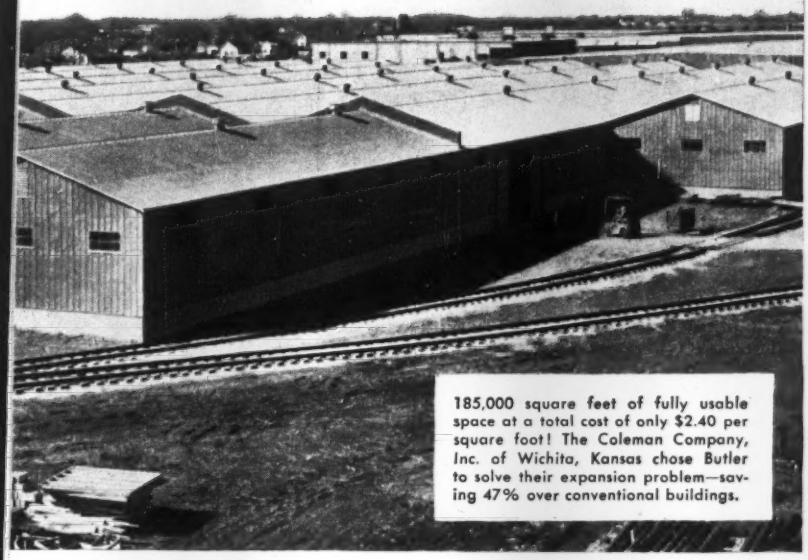
The Joy Champion drills straight, smooth-walled, easily loaded holes, from 5⅝″ to 7⅞″ dia. to any normal depth required. It trams at 5 mph and sets up quickly with 3-point hydraulic leveling. The two models—Mediumweight and Heavyweight—can be furnished with either electric motor or diesel drive. ***Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.*** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

There are no water lines to worry about with a Joy Champion. As the tri-cone bit cuts, a blast of air blows the cuttings to the surface and into a bag-type dust collector.

WAD 4610

JOY

SINCE 1851—OVER A HUNDRED YEARS OF ENGINEERING LEADERSHIP



185,000 square feet of fully usable space at a total cost of only $2.40 per square foot! The Coleman Company, Inc. of Wichita, Kansas chose Butler to solve their expansion problem—saving 47% over conventional buildings.

Build for life...build for less with BUTLER steel buildings

Engineered to modern management needs in a rapidly changing economy—that's why Butler steel buildings give you *more* than mere shelter and workspace. They are a *new* profit-tool for management! Butler's versatile buildings can be modified to new purposes, new installations, new plant layouts—or moved to new locations—quickly and inexpensively. They can be erected in one-half the time required for commonly used materials. Butler buildings equal or exceed conventional structures—in unobstructed clear-span interiors—in snug weather-tight protection for extremes of heat and cold—in appealing good looks, and unbeatable economy!

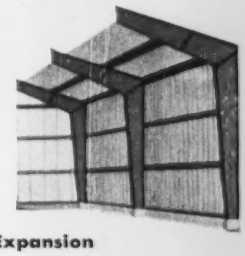
Yes, you build better *for less.* The Coleman Company economy story illustrated above is a common experience of Butler customers. Savings on the original financing—or investment of reserves, will make a real difference in the profit position of your organization from the very start. Lower maintenance costs and depreciation of Butler galvanized or aluminum sheeting will pay you an extra yearly dividend.

Butler buildings are an important part of your profit picture. Write today for full details and the name of your nearest Butler dealer.

Here is why BUTLER is a better buy

Every Foot of Floor Space is Usable

There are no interior posts or columns to waste space and create work-slowing "bottlenecks." Rigid-frame construction also shrinks maintenance costs . . . extends building life.

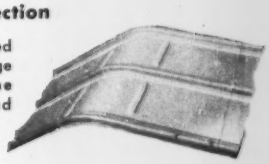


Fast Erection . . . Easy Expansion

Precision-punched and dimensioned bolt holes speed erection—simplify expansion or dismantling and moving. Galvanized bolts, with Neoprene rubber washers, lock deep-corrugated sheets firmly to the sturdy frame.

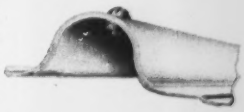
Weatherproof Protection

The one-piece, die-formed roof ridge eliminates ridge roll—helps to make the building leakproof and weather-tight.



Triple-Strength Corrugated Sheets

Butler sheeting, with deep-drawn corrugations formed on 12-inch centers, is three times as strong as ordinary corrugated sheets. Overlapping corrugations bolt tightly together for maximum strength and weather protection. Available in steel or aluminum.

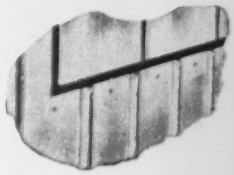


Attractive Curved Eaves

The neat, die-formed eaves—which bolt to the roof sheets—add to the appearance of Butler steel buildings...increase the strength of the eaves . . . help insure weather-tightness.

Weather-sealed Windows and Base

Where corrugated sheets meet windows or the foundation, they are tightly crimped for a snug fit that keeps out snow, moisture and rodents.



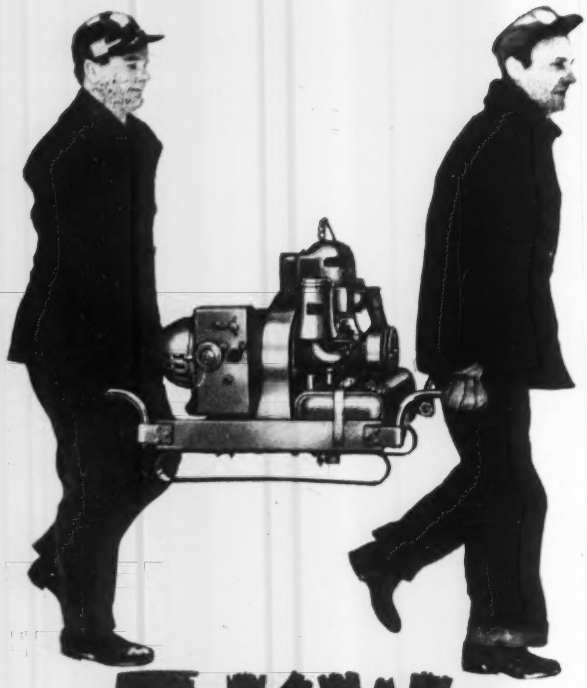
BUTLER® STEEL PRODUCTS

BUTLER MANUFACTURING COMPANY

7418 East 13th Street, Kansas City 26, Missouri
918 Sixth Avenue, S. E., Minneapolis 14, Minnesota
1028 Avenue W, Ensley, Birmingham 8, Alabama
Dept. 18, Richmond, California

Manufacturers of Oil Equipment • Steel Buildings • Farm Equipment • Cleaners Equipment • Special Products

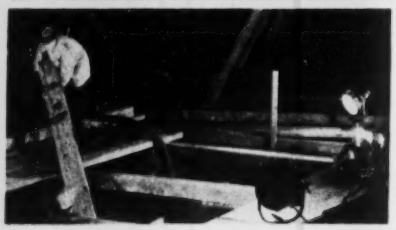
Factories located at Kansas City, Mo. • Birmingham, Ala. • Richmond, Calif. • Galesburg, Ill. • Minneapolis, Minn.



5 KW Dual Voltage 115/230 v

from a HOMELITE GENERATOR

that weighs only 220 LBS.



Plenty of carryable power for all your electric tools

There isn't another generator on the market . . . so light and easy to handle . . . that will give the power that this new Homelite gives. Just think of it! It weighs only 220 pounds . . . at least 100 pounds lighter than any other 5 KW unit . . . and it gives you both 115 and 230 volt current.

Easily put into operation any place you need it . . . by two or four men . . . this new Homelite will give you all the power you need to operate light or heavy tools. You can operate brilliant floodlights, electric drills, saws, grinders, routers, sanders, or even table and radial saws . . . with no drain on the generator or the efficiency of your tools.

Look into it. See this new Homelite in action. Write for a free on-your-job demonstration.

Manufacturers of Homelite
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STEEL INDUSTRY NEWS

NOVEMBER 1, 1953

LEVINSON STEEL NAMES NATIONAL DISTRIBUTOR

New Plan of Distribution Promises More Efficient, Economical Service

The Levinson Steel Company announces the appointment of LESCO CORPORATION as national distributors for all their products and services. In addition to the distribution of plain and fabricated steel for Levinson, Lesco will have in stock for immediate delivery a variety of metal products for builders and industry. Lesco officials state that plans are already under way to further expand their present top-quality lines.

Lesco Corporation can now offer you prompt service on the following.

Fabricated Structural Steel
Steel Bars, Plates, Sheets and Structurals
Open Steel Flooring
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Steel and Aluminum Windows
Steel Doors & Frames
Alsynite Structural Panels
Galvanized & Aluminum Roofing
Standard Metal Buildings

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. . . assuring the same traditional service that has characterized your dealings with Levinson in the past

LESCO CORPORATION

NATIONAL DISTRIBUTORS FOR THE LEVINSON STEEL COMPANY

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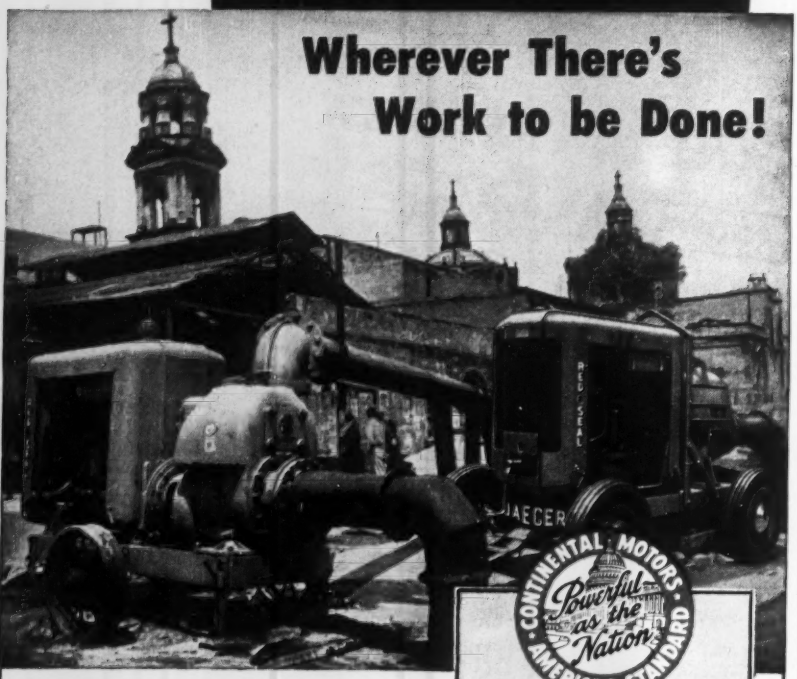
Galion, Ohio – 387 So. Market St.

You Find RED SEALS AT WORK



Continental Red Seal industrial power is getting the call for more and more of the world's tough jobs. Here are two Red Seal M-330's driving pumps on a project where they had to operate almost continuously for a period of several weeks. In-built stamina—fine result of more than 50 years' experience in engineering and precision manufacture—has made Red Seals first choice for assignments where the power plant really has to take it—where work is tough and rest periods few and far between.

LOOK FOR THE RED SEAL TRADEMARK

• • •

EMBLEM OF DEPENDABILITY ON LEADING MAKES OF:

Pumps . . . Compressors
Cement Mixers
Shovels . . . Graders
Earth Movers
Ditchers . . . Rollers
Well Drillers
Paving Machines
Winches . . . Hoists
Conveyors
Industrial Trucks
. . . and other
Specialized
Power Equipment

• PARTS AND SERVICE EVERYWHERE •

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Continental Motors Corporation
MUSKEGON • MICHIGAN

READER COMMENT

Prestress beat alternates

SIR: I quite agree with Mr. Hadley ("Prestress economy doubted," ENR Sept. 3, p. 10) and Mr. Frankland ("Prestress costs need study," ENR Oct. 8, p. 20) that a broader and a longer background of experience in the use of prestressed concrete in the United States is necessary before the question of its relative economy and cost in comparison with other types of construction can be completely resolved.

However, I wish to correct a statement made by Mr. Frankland in regard to the Lower Tampa Bay Bridge. The successful prestressed alternate design was in competition with two other types of construction. The first was a poured-in-place T-beam design, as stated by Mr. Frankland. The second, however, was a precast T-beam design of the type Mr. Frankland advocates but apparently thinks was overlooked by the designers. Hence, the prestressed alternate did not win by reason of the elimination of falsework alone. One of the contractors bidding on the work bid on only the precast T-beam design but his bid was not successful.

It is quite possible that another project involving the same three types of designs will soon be advertised. Engineers and contractors alike will await with interest the results of the bidding.

It may well be that when sufficient time has elapsed to resolve finally the question of the relative economy of prestressed concrete, there may also have elapsed sufficient time to appraise other qualities, including its durability. It could happen that its relative cost ultimately will be found to be of secondary importance. I am waiting for development of the answer.

M. N. QUADE
Parsons, Brinckerhoff, Hall & Macdonald
New York, N. Y.

CALENDAR

Fall meeting, Tennessee Valley section, ASCE, Whittle Springs Hotel, Knoxville, Tenn., Nov. 13-14.

Highway and Surveying conference, University of Florida, Gainesville, Nov. 19-20.

American Institute of Steel Construction, annual convention, Boca Raton Hotel, Boca Raton, Fla., Nov. 30-Dec. 4.

National Conference on Highway Financing, U. S. Chamber of Commerce, Shoreham Hotel, Washington, D. C., Dec. 10-11.

How American Welded Wire Fabric reduces the cost of short-span floors

JUST check the American Concrete Institute Building Code. You will see in Sec. 505b (ACI 318-41) that American Welded Wire Fabric can be drooped continuously across the steel beams that support short-span floors. You just unroll this reinforcement into place; it comes prefabricated in long rolls of the required width. Installation is fast and easy . . . can be made with minimum crews.

Now turn to Sec. 306 of the same ACI Code. There, you find that American Welded Wire Fabric can be stressed with safety to 28,000 psi. (50% of its minimum yield point). That's about 40% higher than ordinary reinforcing materials, and permits you to get the same strength with *28% less steel area.* There is less steel to buy, transport, and handle.

With this superior reinforcing material, you can build better short-span floors . . . and at lower cost. There are 27 standard styles to choose from.

Write to our nearest sales office for complete information.

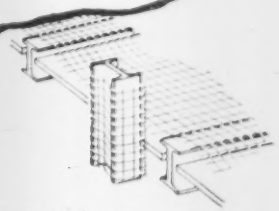
GET A JUMP ON THE WEATHER

order your Wire Fabric now!

When the weather breaks next spring, you will want to dig in *at once* on all important construction jobs. You will need plenty of American Welded Wire Fabric on hand ready for immediate use.

The best way to be sure of having enough is to stock up *now* on the sizes and types you will use.

Get in touch with your local supplier today.



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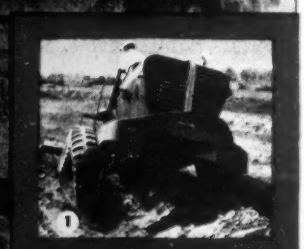
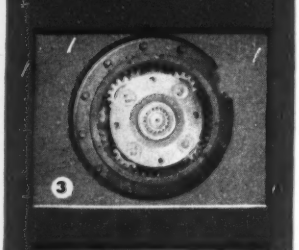
U·S·S AMERICAN WELDED WIRE FABRIC

UNITED STATES STEEL

NEW 4-WHEEL DRIVE Shoveloader

WORKS where other Loaders FAIL!





● This powerful new Shoveloader is designed and built for *HEAVY* work under the toughest conditions. Outstanding features—many of them exclusive—permit top capacity performance in extremely rough terrain, where other units falter and fail . . . Power from the heavy-duty gas or diesel engine is applied through positive 4-wheel drive, 5-speed transmission, forward and reverse . . . Positive 25" downcrowd, bucket width completely covering wheel tread, and operator control of tilt in any position, provide maximum digging and stripping effectiveness. Operator's position insures maximum visibility and safety.

Equipped with 1½ cu. yd. bucket as standard. Also available: 1¼ yard heavy duty and 2½ yard light material buckets, pallet forks, backfill blades and crane hook attachments.

Write for eight-page illustrated Bulletin AD-55, containing complete description and specifications.

1. Rear axle oscillates 23" about longitudinal axis for maximum ground pressure on all four wheels at all times. Hi-flotation type tires permit operation in soft or rough ground.

2. Positive 4-wheel, 5-speed transmission, and 100-inch wheelbase enable unit to negotiate steep earth banks, ramps or obstructions. Hydraulic power steer. Front or rear wheel steer optional. 4-wheel steer available.

3. 3 to 1 Planetary gear reduction in each of four wheels reduces torque 300% in axle shafts, gear case and drive shaft to prevent axle and drive line failure. 4 Planetary gears distribute load evenly to wheel-ring gears.

4. Unobstructed visibility enabling operator to see bucket in lowered position, increases safety and performance. Hydraulic arm-type loader has parallelogram action, with position lift and tilt controls.

Baker Lull

handling equipment

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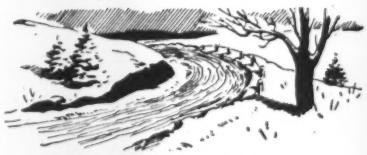
STERLING ROCK SALT SOLVES WINTER'S TWO TOUGHEST TRAFFIC PROBLEMS



HEAVY SNOW

Straight Rock Salt converts normal snowfall into slush for traffic to whisk away. Keeps heavier falls "mealy" for quick and easy clean-up by plow.

ICE AND COMPACTED SNOW

Straight Rock Salt's greater melting power perforates and breaks up ice crust, loosening it from pavement, to be worked to the side by traffic or by one pass of the plow.

Handle Your Ice and Snow... TEN TIMES FASTER AT HALF THE COST

Ten times faster! One truckload of STERLING *Auger-Action* ROCK SALT covers up to 15 miles per load. The same truck, with abrasives, will cover 1½ miles only. *Rock Salt actually does the whole job—and does it better —in one tenth the time.*

Half the cost! STERLING *Auger-Action* ROCK SALT is easier to store and handle. It spreads faster and goes further. Your own accounting will show the cost per mile for rock salt about *half* that of outmoded abrasive-chemical combinations.

WHY STERLING *AUGER-ACTION* ROCK SALT DOES THE JOB BETTER!

STERLING *Auger-Action* ROCK SALT can be used in any mechanical spreader. Requires no special handling or treatment.

Each salt crystal, generating its own heat, quickly bores straight down through the entire crust of snow or ice.

As crystals reach pavement, they become brine which flows laterally, breaking bond between ice and surface.

Broken ice is easily removed with one pass of the plow or scraper. Heavy traffic spots clear themselves by friction of passing vehicles.

ORDER NOW . . . IN CARLOADS, BULK OR 100 LB. BAGS

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JENKINS PRACTICAL PIPING LAYOUTS 70

How to plan an INDUSTRIAL WASTE TREATMENT SYSTEM

In many areas, stringent codes have been drawn up to regulate the types and condition of waste which may be discharged into streams and rivers, in order to conserve existing water supply sources.

Industrial discharges usually require chemical treatment, and one of the most common problems encountered is the neutralization of acid waste. In the system shown here, lime is used as the neutralizing agent. The waste normally flows to a digester which allows for settlement of solids and serves as a storage center. Flow from the digester to the treatment tank is regulated by a liquid level controller.

The treatment tank is equipped with an agitator which mixes the waste with the lime slurry to provide a neutral solution. The proportion of lime to be added is determined by a recording pH regulator, which operates the control valve on the slurry line and admits the required amount of slurry for neutralization. The slurry is made by admitting quicklime and water to the lime slurry mixer, which is equipped with an agitator. Emergency lines for direct discharge bypassing the treatment system are indicated in the diagram.

Consultation with accredited piping engineers and contractors is recommended when planning any major piping installation.

Diagram by Huxley Madeheim, Consulting Engineer
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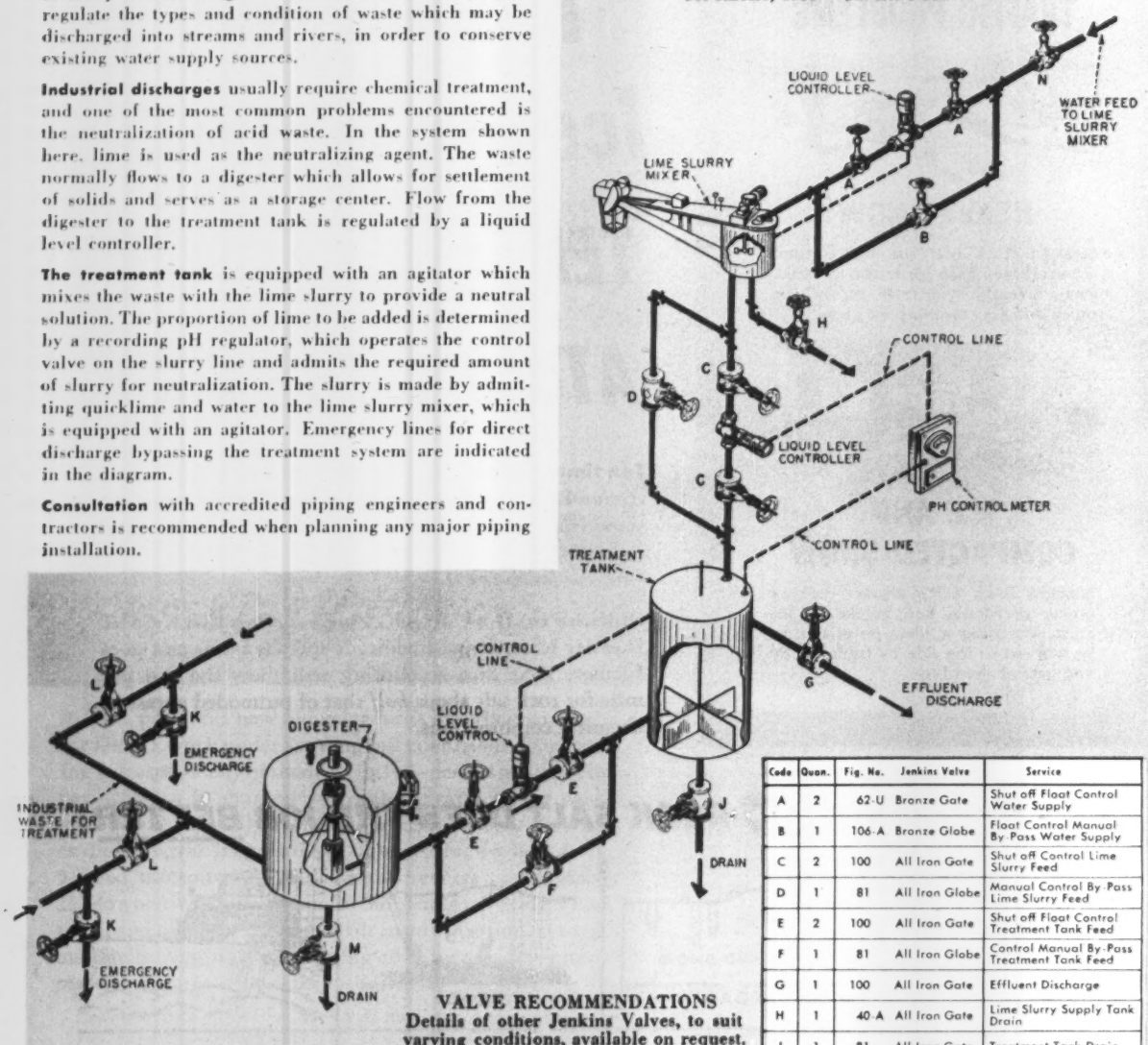

VALVE RECOMMENDATIONS
Details of other Jenkins Valves, to suit varying conditions, available on request.

Code	Quan.	Fig. No.	Jenkins Valve	Service
A	2	62-U	Bronze Gate	Shut off Float Control Water Supply
B	1	106-A	Bronze Globe	Float Control Manual By-Pass Water Supply
C	2	100	All Iron Gate	Shut off Control Lime Slurry Feed
D	1	81	All Iron Globe	Manual Control By-Pass Lime Slurry Feed
E	2	100	All Iron Gate	Shut off Float Control Treatment Tank Feed
F	1	81	All Iron Globe	Control Manual By-Pass Treatment Tank Feed
G	1	100	All Iron Gate	Effluent Discharge
H	1	40-A	All Iron Gate	Lime Slurry Supply Tank Drain
J	1	81	All Iron Gate	Treatment Tank Drain
K	4	100	All Iron Gate	Emergency Waste Discharge
L	4	100	All Iron Gate	Shut off Waste Lines
M	1	81	All Iron Globe	Digester Drain

To simplify planning, to save time, to get all the advantages of Jenkins specialized valve engineering experience, select all the valves you need from the complete Jenkins line. It's your best assurance of *lowest cost in the long run.* Jenkins Bros., 100 Park Ave., New York 17.

Complete description and enlarged diagram of this layout free on request. Includes additional detailed information. Simply ask for Piping Layout No. 70.

SOLD THROUGH LEADING INDUSTRIAL DISTRIBUTORS EVERYWHERE

JENKINS VALVES
LOOK FOR THE DIAMOND MARK
SINCE 1864
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THE CONSTRUCTION WEEK

• **Rules for ready-mix?**—New York City's Concrete Industry Board (ENR June 14, 1951, p. 25)—which prefers to work through open discussion, rather than by resolution—may be ready to spark further reforms that'll be of interest to ready-mix makers and users generally:

1. A possible city ordinance (as part of the building code) that would specify a maximum water content and require foremen to take written responsibility for more than the specified amount;

2. A set of minimum standards for approval of ready-mix plants;

3. A drive to urge cement manufacturers to insist on more uniformity in their product, and for more exact specifications as to color, strength, durability and other factors.

CIB (which had just elected Roger Corbetta of Corbetta Construction Co. as its chairman for the third consecutive year) got the ordinance proposal from Hugh Quinn, head of the New York City Council's codes committee, and himself a contractor in his home baliwick of Queens.

• **Equipment factor**—With its $200-million secondary road program virtually ended, the North Carolina State Highway Department has found itself holding some very hot potatoes in the form of hundreds of pieces of construction machinery and spare parts.

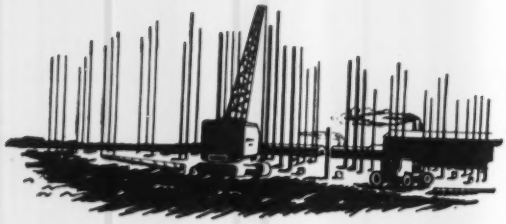
When the state embarked on the road program a couple of years ago, it stirred up a hornet's nest of contractor objections when heavy purchases of machinery for state forces were made. One contractor even went so far (ENR Feb. 16, 1950, p. 27) as to take the matter to court (unsuccessfully) on the ground that use of the bond-supplied money for such purchases was illegal.

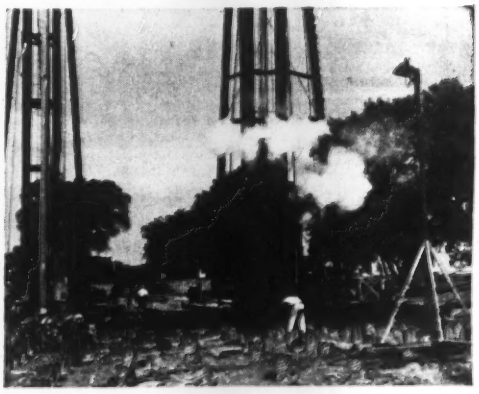
Now a new state administration and a newly named highway commission chairman (A. H. Graham) have appointed a three-man committee to "go into the equipment business in detail," make an inventory, and decide what to do with the material.

• **Weather report**—Here's the U.S. Department of Commerce, Weather Bureau, 30-day forecast for the month of November. It should be read along with the tables of normal precipitation and temperature ranges published as part of ENR's regular service in the issue of Oct. 29, on page 48.

The 30-day outlook for November calls for temperatures to average above normal over the eastern third of the country, below normal over the western third, and about normal over the central portion.

Precipitation is expected to exceed normal over most of the area east of the Continental Divide, except in the South Atlantic States where it may be about normal. West of the divide—except in the Pacific Northwest where subnormal amounts are indicated—normal precipitation is expected.





Foundation costs go down WITH ARMCO PILING

Conditions vary with piling jobs. But with Armco Foundation Pipe your installation can be economical and dependable, regardless of job size, loadings or soil.

One of the two types of Armco Foundation Pipe—Armco Spiral Welded Pipe and Armco HEL-COR Pile Shells—will supply the low-cost answer to your foundation problem. Both types are available in a wide range of diameters in extra-long lengths.

Armco Spiral Welded Pipe offers uniform properties that assure high collapse resistance and extra lateral stiffness even in the longest lengths. Constant cross-section and uniform diameter provide maximum end bearing in good strata. Straight-driving Armco Piles transmit the force of the driving blow to the point with minimum loss.

Helically corrugated Armco HEL-COR Pile Shells are watertight, easily handled, light weight, extremely straight, and of uniform diameter. They are reliable and economical for drop-in or mandrel-driven shells and for the top portion of composite piles.

With either type of Armco Foundation Pipe you can save money by specifying what you need and by on-the-job welding of salvaged lengths. Write for complete details. Armco Drainage & Metal Products, Inc., 3843 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

ARMCO FOUNDATION PIPE

ARMCO

Construction is bound to be affected—and the pressures are for more, not less—by the new look Republican bigwigs are taking at their policies as a result of the set-backs the party took in the elections.

All signs point to the President pushing a more "liberal" program, that means moving toward the left—in effect, generally taking a political line that's closer to the policies of Democratic administrations of the past.

•

Here are some of the areas where pressure will be felt to do more next year than has been done this year:

Flood control and rivers and harbors—Republicans in Congress will put even more steam behind their pet projects in the big authorization bill coming up next year.

Reclamation—Interior Secretary McKay now has additional leverage to take the lid off new starts and get a dam started under Republican auspices.

Hard money policy—Credit has been easing and the Administration will make sure it doesn't tighten again in the year ahead.

Housing credit—Lower down-payments aren't planned for the foreseeable future; but any slide in starts next spring would trip the trigger.

Public housing—Any further cutbacks are out, and there is a good chance for more than the 20,000 units authorized for this year.

Labor—Odds again favor Administration Taft-Hartley recommendations that will sit well with labor. But chances of getting such amendments through Congress are still doubtful.

Taxes—Talk increases about "a Republican tax cut"; that is, a tax reduction in addition to the ones now scheduled (which were voted by the Democratic Administration).

•

This next election-year session of Congress will be a rough one. The priority on politics will produce plenty of Republican family squabbles. **The Democrats**—with as many votes as the Republicans—will be doing their bit to make the GOP look bad and themselves look good.

•

You will get quicker Davis-Bacon rulings from the Labor Department from here on out as a result of some old-fashioned house-cleaning and reorganization of the solicitor's office. (See page 22.) Some real results already:

Backlog of wage determinations needed for government construction projects is down from about 1,000 to 350.

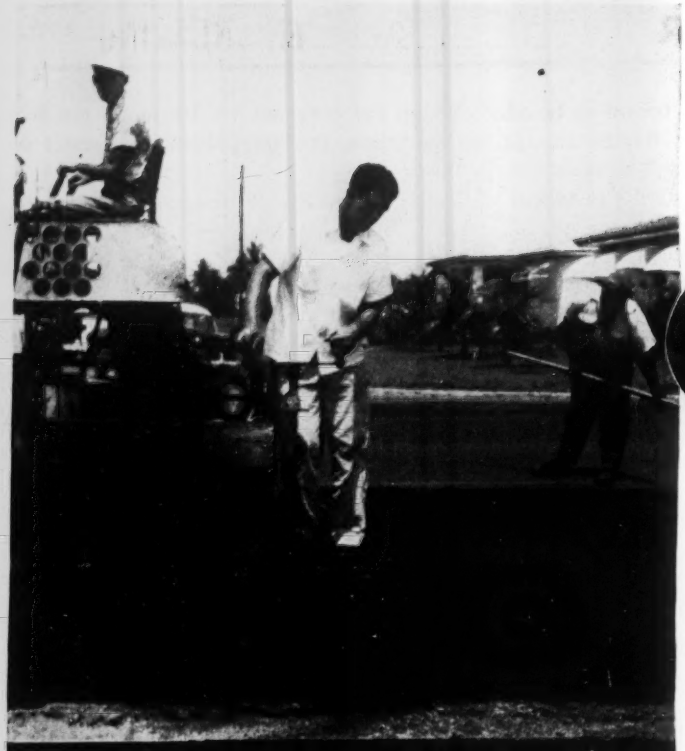
Davis-Bacon violations under investigation were cut from 145 to 7. More contractors with "extreme records" of violation were being put on the ineligible list.

Some 66 anti-kickback cases under the Copeland Act on the books as of August were cleaned up.

•

Spanish base preliminaries are moving faster than expected. There's a step-up in preparations aimed at getting construction under way at earliest possible moment.

Deadline for contractor teams to submit brochures on their abilities to handle the entire construction program has been advanced. Applicants now have to get their material in to Chief of Bureau of Yards and Docks by December 1. Bureau had been figuring on receiving brochures up until the first of the year. Now, contractor will be picked by them.



Natural Rubber

may be Your Way To S-T-R-E-T-C-H Highway Dollars

Results from more than a score of test roads of natural rubber laid in the U. S. as far back as 1949 give definite promise of a new era in highway building. Both laboratory and in-place studies indicate that natural rubber roads will last longer, require less maintenance, and aid greatly in stretching our burdened highway budgets.

The Natural Rubber Bureau's Research Laboratory is staffed with experienced highway engineers who are ready to assist you in planning and installing test strips of natural rubber roads.

Do you have a question on rubber roads? For the answer, just mail the inquiry sheet, or write direct.

Natural Rubber Bureau

1631 K STREET, N. W. WASHINGTON 6, D. C.

Natural Rubber Bureau Research Laboratory
Rosslyn, Virginia

MAIL THIS INQUIRY SHEET *today*

NATURAL RUBBER BUREAU
1631 K Street, N. W., Washington 6, D. C.

With no obligation, please send me engineering data for laying a test strip of natural rubber-asphalt pavement as follows:

1. Length of proposed test strip ..... miles
   Width of proposed test strip ..... feet
2. New Construction ☐ Resurfacing ☐

PLANT MIX	SURFACE TREATMENT
Type: Hot ☐ Cold ☐	Grade of Bitumen .....
Grade of Asphalt	Application Rate ....gals. per sq. yd.
Penetration	
Depth of Top Course ....., inches	COVER MATERIAL
Aggregate Content .....%	Type of Aggregate .....
Aggregate Top Size .....%	Size of Aggregate .....
Bitumen Content .....%	Lbs. per sq. yd. .....

Name .....
Title .....
Dept. .....
Address .....
City ..... State .....

☐ Please send booklet "STRETCHING HIGHWAY DOLLARS WITH RUBBER ROADS"

☐ Please send information about new 30-minute motion picture on rubber roads

Most of bond issues carry as voters ok construction

Half-billion Ohio road bonds top list of issues approved at elections—most other bonds approved to pay for buildings for governmental units

Showing no disposition to cut down on the services provided to them by their local communities and states, U. S. voters Nov. 3 approved an overwhelming number of bond issues that will pay for public improvements—most of them involving construction.

According to figures made available to this journal by the Daily Bond Buyer, voters in areas across the country had approved over 77% of the more than $1.055 billion in bond issues on which they had been asked to vote.

That percentage of approval—accounting for a total of $813 million—already compared favorably with voter action a year ago, an ENR analysis of Bond Buyer figures indicated, and will go higher as detailed reports become available from outlying voting areas. In 1952, voters approved 85% of proposals that totaled $1.460 billion.

The total of bonds offered for voter approval this year was said to be the smallest for any year since the end of World War II—probably signalizing a greater proportion of capital improvement financing from tax and other current revenue sources by municipal governments, financial experts added. Most of this year's offerings were comparatively modest in scale.

• **Top issue**—The biggest proposal on the list was the State of Ohio's $500-million highway improvement bonds.

The issue will pay for principal and secondary road improvements, and is backed by state highway revenues, and is in addition to the $326-million bond-financing of the Ohio Turnpike. The measure was given only a 50-50 chance of carrying in the face of firm opposition by Governor Frank Lausche (ENR Oct. 15, p. 17), who believed that piling such additional debt on the state would work to the detriment of the general highway program.

• **Other action**—Other major bond issues approved included:

A $35-million issue for Cuyahoga County (Cleveland), Ohio, to finance a subway system in downtown Cleveland (ENR Oct. 8, p. 211); $39 million to finance municipal buildings and other structures at St. Paul, Minn., including schools, street and bridge work, sewer construction and rehabilitation; $36 million for Chicago sewer, bridge, street and other civil construction; a total of $76 million in various loans for Philadelphia civic purposes; $10 million for sewer system work at Akron, Ohio.

Among significant items flatly thumbed down were:

A $4-million administration building for Cuyahoga County, Ohio; $16.7 million for various civic purposes in San Francisco; a $6.2-million sewage treatment plant at Erie, Pa.; a $4.5-million educational institute building for the state of New Mexico.

It was apparent that voters had turned down few projects that appeared at all necessary for community service.

• **Breakdown**—A breakdown of the results, as tabulated by ENR:

Approved: heavy construction, $705 million (total), of which $518 million was in highways, $87 million in sewerage, $16 million in waterworks, $10 million for bridges, and $71.7 million unclassified. A total of $107.5 million was approved for buildings of all types, of which $81.1 million was allocated for schools.

To date, the total of issues disapproved was $47.6 million.

St. Lawrence power plans go forward but court cases may delay financing

The St. Lawrence power project got a step nearer the construction stage last week with the President's formal designation of the Power Authority of the State of New York as the U. S. agency for the joint venture with Canada.

Shortly after the President acted, John E. Burton, chairman of the authority, announced the selection of Sanderson & Porter, New York, and Charles T. Main, Inc., Boston, as the engineering firms for the project.

Canada already had selected the Hydro Electric Power Commission of Ontario as its representative on the $316-million power project in the International Rapids Section of the St. Lawrence River.

• **Army Engineer plans**—The detailed plans for power and navigation structures to be built in the International Rapids Section of the river were made by the Army Engineers in 1942. They called for a dam and powerhouses for the two countries across the river at the lower end of Barnhart Island, another dam across the long fault at the upper end of the island, and a control dam farther upstream to regulate the flow from Lake Ontario.

These plans formed the basis of the Power Authority's application to the Federal Power Commission, and since that application was made, three consulting engineers have been revising them and bringing them up to date. They are Franklin J. Leerburger and Constantine Belousow, New York, and Asa George, Ithaca. These engineers hereafter will serve as liaison between the authority and the two firms of engineers who will prepare detailed plans on which bids are to be called.

The power authority hopes to have preliminary plans ready for bids on the initial construction work within six months. It must have construction started within a year under terms of its license.

• **Cases will be expedited**—There are three petitions before the U. S. Circuit Court of Appeals for the District of Columbia, asking the court to review the Federal Power Commission order issuing the license to the N. Y. State Power Authority (ENR July 16, p. 21). The three appellants are the Public Power and Water Corp., Trenton, N. J.; the Central Pennsylvania Coal Producers Assn., and the Lake Ontario Land Owners and Beach Protective Assn. All appeared before the FPC to object to the granting of a license to the N. Y. Power Authority. The Public Power and Water Corp. of Trenton had applied unsuccessfully for a license.

Lawyers for the federal government

have made plans to push the St. Lawrence case through to a Supreme Court decision before the tribunal's present term ends next June.

Meanwhile, the financial houses of Harriman Ripley Co., Lehman Brothers, R. W. Pressprich & Co., and Union Securities Corp. are developing a bond financing plan for the power authority.

Hoover Commission's water and power group includes 12 leading engineers

Wide geographical distribution and a strong conservative bent characterize the 26 members appointed this week to the water and power resources task force by Chairman Herbert Hoover of the new commission to reorganize the government's Executive Branch.

Leading the list of appointees is a baker's dozen of engineers—half the total membership of the task force—including its head, Adm. Ben Morcell (ENR Oct. 22, p. 21). Lined up with this engineering crew are five lawyers, two certified public accountants, a construction contractor, a state governor and a former governor, two newspaper publishers, and a cotton broker.

The task force will do for water and power development what Congress and the President have spelled out as the overall job for the entire commission: (1) Determine what functions the federal government should perform and what ones it should drop, and (2) parcel out the approved federal functions among agencies to get the best service for the least cost.

There is no chance that the task force announced this week will endorse —or even countenance—the free-wheeling policy of federal resources development that reached its peak during the New Deal-Fair Deal era. Observers expect the task group to recommend close circumscribing of federal functions in water and power resources programs—and tight control of those functions by the Executive and Legislative Branches.

Engineers named to the task force include these well-known figures:

Royce J. Tipton of Denver, consultant to the state of Colorado, the U. S. Bureau of Reclamation and the U. S. State Department, as well as to many other clients, on water matters.

Malcolm Pirnie of New York, consultant to several government agencies, recipient of the Hoover Medal from the engineering societies.

Charles Edison, chairman of Thomas A. Edison, Inc., former Governor of New Jersey and Secretary of the Navy.

Wesley W. Horner of St. Louis, consulting engineer, former president of ASCE and chairman of the Water Policy Panel of Engineers Joint Council.

Julian Hinds, former general manager and chief engineer of the Metropolitan Water District of Southern California (see page 2 .).

Arthur B. Roberts of Cleveland, consulting engineer who has served the House Appropriations Committee and who prepared the report on water projects for the old Hoover Commission.

William D. Shannon of Seattle, consulting engineer who has served in the state legislature and as chairman of the public utilities commission.

Carey H. Brown of Scottsville, N. Y., chairman of the Engineering Manpower Commission and member of the water policy task force for the Engineers Joint Council.

Malcolm Elliott of St. Louis, consulting engineer on water resources, former division engineer for the upper Mississippi River, Army Engineers.

James P. Growdon of Pittsburgh, retired chief hydraulic engineer, Aluminum Co. of America.

Albert C. Mattei of San Francisco, president of Industrial Research Laboratories and of Honolulu Oil Corp., also on National Petroleum Council.

Working with these engineers will be a world-renowned contractor, Harry W. Morrison of the Morrison-Knudsen firm, whose main office and home is Boise, Idaho.

Two other members besides Edison have state house experience behind them. They are Leslie A. Miller, former Governor of Wyoming and chairman of the task force on natural resources for the old Hoover Commission, and J. Bracken Lee, Governor of Utah since 1949.

The five lawyers are Roscoe Pound, Dean of the Harvard Law School; William Bates, Houston lawyer and banker; Pope F. Brock of Atlanta; John W. Reavis of Cleveland, and Donald Richberg.

The two publishers are Harry E. Polk of Williston, N. D., former president of the National Reclamation Assn., and Robert Sawyer of Bend, Ore. Jon Jirgal of Chicago and E. A. Kracke of Montclair, N. J., are the accountants. Charles Andrews, Memphis cotton broker, represents his area as a civic leader and president of Southern Cotton Shippers Assn. In addition to its engineer members, the task force is to have two engineer-trained consultants, Cameron MacRae, attorney, and Morris R. Scharff, consulting engineer, of New York.

Davis-Bacon Act

Labor Department report cites marked speed up in rulings and enforcement

Streamlined handling of Davis-Bacon problems has produced sensational results in the last few months, a Labor Department progress report claimed this week.

More efficient service and greater interest in proper enforcement of the law regulating wages on government construction were cited by the report. Meantime, the new Secretary of Labor, James P. Mitchell, took a personal interest in contractor complaints that Davis-Bacon was being administered improperly in favor of specialty unions (ENR Oct. 15, p. 27). This was shown by his meeting with contractor spokesmen.

Major credit for the improved handling of Davis-Bacon matters is given to a reorganization of the Labor Department solicitor's office earlier in the year. Actually the office has a smaller budget, 45 fewer attorneys in Washington and four instead of eight assistant solicitors. But even so, Solicitor Stuart Rothman's report to Secretary Mitchell showed these accomplishments over the past three months:

- Backlog of requests for Davis-Bacon prevailing wage rate ruling was reduced from 1,000 projects in August to 350, which can be handled in about a week's time, on the average. Rulings awaited for more than three weeks were cut from 357 to 58.
- Contractors' letters are being answered quicker as a result of an improved card index of up-to-date local wage rates.
- Wage determinations are going out faster than they are coming in. During August and September, the Labor Department received 2,695 requests and issued 3,165.
- A coordinated program for enforcing Davis-Bacon has been set up, with the result that violations requiring immediate attention were reduced from 145 to seven. Responsibility has been decentralized to regional offices and more use is being made of field personnel. A handbook has been prepared of legal and enforcement information for the use of regional offices and other government agencies "whose cooperation must be obtained for any meaningful enforcement program."
- There has been "more activity" in placing on the ineligible list those contractors with "extreme records" of Davis-Bacon violations.
- With respect to violation of the Copeland anti-kickback law, there were 66 matters pending in August. All have been cleaned up.

Curved crossing of San Francisco Bay seen as answer to Army Engineers' veto

Straight-line Army St.-Bay Farm Island route is out due to Navy's objections over proximity to seadrome

A curved crossing of San Francisco Bay, which would veer 500 ft to avoid interference with future Navy jet seaplane operations, last week looked like the probable answer to the Army Engineers' veto of a straight-line Army St.-Bay Farm Island route.

Application for the $200-million straight-line causeway and tunnel crossing was turned down solely on the basis of the Navy's objection to its proximity to seadrome lanes for the nearby Alameda Naval Air Station (ENR Aug. 27, p. 24; Sept. 3, p. 17).

Gov. Goodwin J. Knight deferred decision on making a second application to the Army Engineers until he could get a ruling from his attorney general as to whether request for the curved route is in line with the state law that authorized the second or southern bay crossing.

One interpretation of the law, cited chiefly by opponents of the Army St.-Bay Farm Island route, is that it requires selection of a new site if the straight-line crossing is disapproved. The alternate location that has been proposed is the Candlestick Point crossing, three miles south of the Army St. site (ENR July 2, p. 25).

The governor declared that, if the attorney general's findings support making a new application for the curved route, he will ask California Toll Bridge Authority, of which he is ex-officio chairman, to submit such request immediately.

• **Engineering studies**—If further studies are required, the governor said funds will be taken from proceeds of a $1.5-million bond issue floated by the toll bridge authority in September to complete plans for the crossing.

Right after the Army Engineers' decision the governor was under pressure from city officials to apply for a curved crossing so the Army St.-Bay Farm Island route could be retained.

As a matter of fact, the city of San Francisco, which originally favored a straight-line crossing at Army St., had shifted its backing to the curved-crossing alternative at the time the Navy raised its objection during hearing on the application. But the state continued to back straight-line crossing.

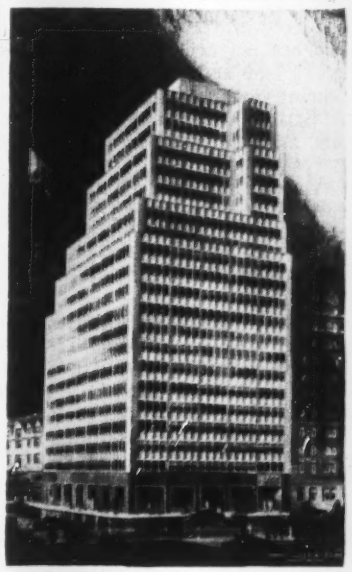
There were indications that a new application, requesting the curved crossing, would get immediate and favorable action. Maj. Gen. Samuel D. Sturgis, Chief of Engineers, was quoted as saying, "I understand there is under consideration an alternate route (curved crossing) which would be acceptable to the Navy. However, that was not before me since it was not mentioned in the application. If a new application is filed, I know that my division and district engineers will act on it promptly, and it won't take any time to get action at my office here."

• **Tube held no hazard**—Meanwhile, in San Francisco, Army District Engineer Col. George H. Walker made public his recommendation against the straight-line crossing. The report, endorsed by Col. Paul D. Berrigan, Army Division Engineer, objected to the straight route solely because of the Navy's opinion. It did not agree with contentions made by opponents of the Army St. crossing that a tube under the channel, would create hazard to the nearby Hunters Point Naval shipyard. This group claimed that if the tube were bombed in wartime it would interfere with navigation, blocking off the shipyard.

The report added that San Francisco seems "reconciled to accepting the Department of the Navy's minimum realignment, curved-route requirements." Walker's report cited no opposition to a curved crossing.

Col. Berrigan, South Pacific Division Engineer, said he considers the curved route a "minor deviation" in the Army St. crossing specified in the original application. He indicated a hearing probably would be waived if the state proposes a curved crossing.

"We'd file the usual 30-day notice describing the amended plan and, if the notice didn't turn up much opposition, we probably would by-pass an expensive hearing," he said.



A SECOND ALUMINUM-FACED skyscraper is under construction on New York's Park Ave. at 57th St. by Tishman Realty & Construction Co., owner-builder of 99 Park Ave., a 26-story office building that was enclosed with two-story high aluminum panels in 6½ days (ENR Aug. 13, p. 43). Similar panels will be used for the new 22-story air-conditioned structure, which will contain 220,000 sq ft of rentable area. Foundation work is nearly complete and steel work is scheduled to begin in a few weeks. Installation of panels is expected to start in January and take five days. Architects are Emery Roth & Sons.

Two workmen die as Golden Gate scaffold fails

Two Judson Pacific-Murphy Corp. workmen were killed when one of the permanent traveling scaffolds under the Golden Gate Bridge over the entrance to San Francisco Bay failed Friday, Nov. 6. The scaffold had been in continuous use for maintenance painting since the bridge was opened some 15 years ago. The workmen were part of a Judson Pacific-Murphy crew working on installation of a bottom lateral system that will provide greater stiffness to the suspended bridge deck—and thus greater resistance to wind induced motion.

The accident occurred as the scaffold was being moved by the workmen using hand winches. It is believed that a structural member of the scaffold failed, causing the entire traveler to swing loose and fall into the water.

Gravity ore loading system for Ontario

A gravity ore loading system, utilizing a cliffside on the north shore of Lake Ontario at Picton, Ont., is being built to move pelleted ore from Bethlehem Steel holdings at Marmora.

Railway cars will travel on concrete trestles over a pit 800 ft long, 80 ft wide and 60 ft deep, which is now being excavated in the clay and limestone cliff by H. J. McFarland Co. of Picton. Ore dumped from the cars will feed a conveyor belt at the bottom of the pit. Another belt will convey the ore through a 120-ft tunnel to the waters' edge for ship loading.

Army Engineer dams cut drought losses

Release of stored water has sustained vital shipping, curbed pollution, and aided community water supply

Army Engineer dams on the Mississippi-Missouri-Ohio River systems, including many not yet completed, have been doing much to mitigate the effects of the prolonged drought that has menaced the central part of the country.

Release of water stored behind these dams has kept vital inland waterway shipping afloat, prevented serious pollution and provided sorely needed water supply for drought-stricken communities. Flood control and navigation dams provided from 75% to 90% of the flows in some reaches of the three rivers.

Specifically, an Army Engineer survey finds that, without the water made available by its storage facilities, the drought would have had these results:

- Barge movements in the Ohio Valley would have been sharply curtailed, critically affecting the transportation of coal and the production of steel.
- Commercial navigation on the Mississippi would have been curtailed from St. Louis to Cairo, Ill., because of impaired channel depths.
- Commercial navigation "would have been stopped cold" from the mouth of the Missouri River to Kansas City.
- Water supply for numerous communities would have been impaired, with deterioration of quality and greatly increased stream pollution because of heavier concentrations of sewage and industrial wastes.

• New Orleans has trouble—Without the release of stored water, barge loading on the Mississippi at St. Louis would have to be reduced to 6 or 7-ft drafts, instead of the normal 9 ft. Of the 67,000 csf flow at St. Louis on Oct. 22, 26,000 csf was coming from storage in Montana's Fort Peck Dam. An additional 2,500 csf was coming from reservoirs on the upper Mississippi. Without the stored water, the flow at St. Louis would have been 39,000 csf, whereas 54,000 csf is considered the minimum for satisfactory commercial navigation.

Although the benefits reach down as far as Cairo, a serious situation exists at New Orleans, the Army Engineer report reveals. Salt water from the Gulf of Mexico extends some 130 miles upstream and is threatening the city's water supply. The city has appealed for additional water from any available upstream reservoir to raise the Mississippi's level in order to push back the salt water intrusion.

On Oct. 31, the river at New Orleans had a flow of 110,000 cfs as compared with a flow of 200,000 cfs considered necessary to protect against salt water. Without the water from Fort Peck, 1,900 miles away, the New Orleans flow would have been about 90 cfs.

Fort Peck's benefits were even greater on the Missouri. Seventy-five per cent of the Missouri's flow at Omaha was reservoir water. The same percentage held at Kansas City. Without the reservoir, the stage would have been only 0.2 ft over the absolute minimum required for sanitation and municipal water supply.

• Ohio Valley aided greatly—In the highly industrialized Ohio River Valley, water releases from nine Army Engineer dams have contributed measurably toward keeping coal moving and steel mills producing.

Eighty per cent of the Mahoning River's flow at Youngstown currently is being maintained by water from the Berlin and Mosquito Creek reservoirs and the locally built Milton reservoir.

Warren, Ohio, an important steel center in the Mahoning River Basin, would be faced with a crippling water shortage without the upstream reservoirs. Twelve communities in the Monongehela River Basin, which rely on river water for domestic supply, would be in serious straits were it not for the Army's Tygart and Youghiogheny reservoirs which are contributing 90% of the river's flow.

Navigation on the upper Monongahela would be impossible without reservoir water now being supplied. At Pittsburgh, Pa., reservoir storage on the Allegheny and Monongahela has contributed one-third of the flow in the river, from which that city gets its water supply.

Similar conditions prevailed at Wheeling, Cincinnati and Cairo. At the latter city, near the mouth of the Ohio, the flow last week was 37,000 cfs, of which 20,000 cfs was coming from reservoir storage.

Navigation of the Ohio proper has not been seriously affected despite low flows which have required careful operation of locks and dams.

In the Southwest, the worst drought in history cut stream flows and completely stopped them on several major rivers, causing ground water tables to fall and creating critical problems in city and industrial water supply, pollution and stock watering.

Water stored behind 27 Army Engineer multiple-purpose dams played a major part in helping to keep streams alive and providing water for municipal and industrial use.

Trinity River flood control bolstered

Recent dedication of the Army Engineers' $12-million Lavon Dam, 30 mi northwest of Dallas, Tex., brought in the third of four vital flood-control projects in the Trinity River Basin.

Aside from flood control, Lavon Dam will serve as a water supply for 10 communities in the North Texas Municipal Water District. Dallas is negotiating for water storage there.

The Trinity River Basin program (ENR Aug. 25, 1949, p. 30) involves four Army Engineer dam projects among other planned floodway improvements. The Grapevine Dam on the Elm Fork of the Trinity River was completed last year. Benbrook Dam on the Clear Fork of the river, near Fort Worth, was completed.

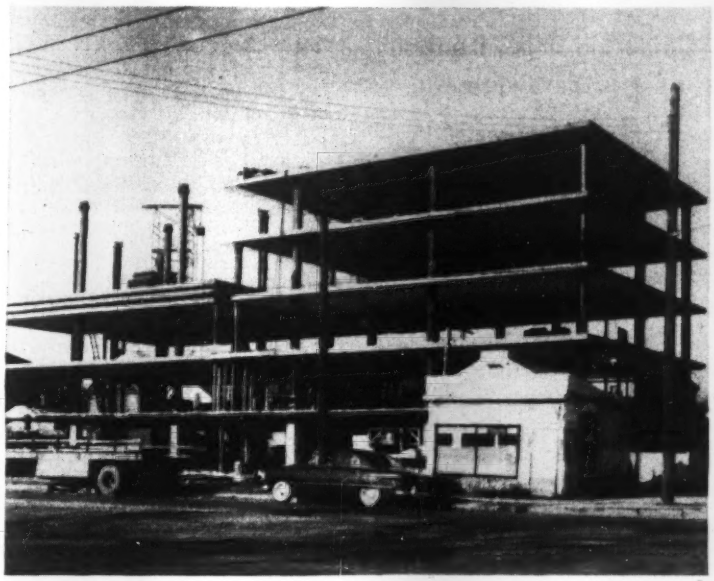
The Garza-Little Elm Dam on the Elm Fork, near Lewisville, a $24-million project, is scheduled to be completed in 1954.

Lavon Dam is 9,540 ft long, with a height of 69 ft above stream bed. The spillway section includes 12 tainter gates, 40 x 28 ft, for flood control. Normal pool will have a top elevation of 472 ft and a capacity of 105,000 acre-ft. Area covered will be 11,080 acres with a shoreline of 83 mi. The flood-control pool will have a top elevation of 490 ft to provide 275,600 acre-ft of flood storage. Maximum area will be 20,050 acres, with a shoreline of 130 mi.

Ground was broken for Lavon Dam in December 1947. J. W. Morrman & Sons of Muskogee, Okla., held a $2-million contract for spillway excavation and embankment work. Texas Construction Co. of Dallas constructed the concrete spillway section and installed control gates under a $2-million contract.

Eklutna tunnel

A 4-mi. tunnel which will carry water from Lake Eklutna in Alaska to hydroelectric turbines at the foot of Goat Mountain 30 mi. north of Anchorage has been holed through. Work has been under way on the 9-ft. dia. tunnel for two years. Completion of the $32-million federal power project, largest in Alaska, is scheduled for January 1955.



Six stories go up by lift-slab method

The tallest structure on which the lift-slab method has been utilized to date is a six-story nurses' residence being built for the general hospital at Winnipeg, Man.

The lift-slab method permits the casting of reinforced concrete floor slabs of a multi-story building at ground level. Not only does this simplify and speed up the casting operation, but there also is a saving in formwork. The slabs cast first serve as bottom forms for those following; edge forms are required but the same ones can be used for each slab. The method is carried out under license from the Southwest Research Institute, San Antonio, Tex.

The brick-enclosed residence for nurses, being built at a cost of $300,000, will provide 50 suites above the first floor and a parking garage at grade. Occupying a 50x120-ft area, it will have structural steel columns (12-in. WF 80-lb) spaced 24x25 ft, five flat-slab reinforced concrete floor slabs above grade and a steel deck roof.

Each slab was cast at ground level in two units, each unit weighing 337,500 lb. Columns were erected first to a height of slightly more than 30 ft. Jacks placed on top of them lifted the fifth and sixth floor slabs to a temporary position about 30 ft above the ground and then the third, second and first floors to their final position. After the columns were extended to the fifth floor, the fourth and fifth floors were jacked into place. Lifting was carried out at about 4 ft per hr.

General contractor is Frank R. Lount & Sons; architects are Smith, Munn, Carter and Katelnikoff; and lifting contractor is Canadian Lift Slab. All are Winnipeg firms.

The Moles 1954 award winners named

J. Rich Steers of New York City, and Glenway W. Maxon of Dayton, Ohio, have been named winners of The Moles 1954 awards for outstanding achievement in construction. Awards will be made at the annual dinner in New York City Feb. 3.

Since 1947 Steers, as president of J. Rich Steers, Inc., has directed four large undertakings in the Mediterranean area. One is the rehabilitation of the three main harbors of Greece and the Corinth Canal. The others: construction of a high-frequency radio station at Tangier; a naval base at Port Lyautey and the Wheelus Air Force Base at Tripoli, Libya.

Maxon is president of Maxon Construction Co. Dams, lock and bridges—principally on the Ohio and Mississippi Rivers and tributaries—have figured most prominently in his work.

The Moles awards originated in 1941. Since then the organization of tunneling and heavy construction leaders has honored such men as former President Herbert Hoover; Robert Moses, New York City construction coodinator; Adm. Ben Morell and Gen. Brehon B. Somervell.

Michigan toll roads

The $200-million, 176-mi. Detroit-Chicago route is held practicable venture

The Michigan Turnpike Authority has been told that a proposed 176-mi toll road running west from Detroit toward Chicago would be a practicable venture even though it would parallel the projected Indiana turnpike.

Connecting with the west end of the Willow Run expressway near Ypsilanti, the proposed toll highway would run north of Jackson, Albion and Marshall, south of Battle Creek and Kalamazoo, west to Benton Harbor and south to New Buffalo. South of New Buffalo, the route would join the planned Indiana turnpike (ENR Oct. 29, p. 23).

Indications that the $200-million project would be a paying proposition were contained in a preliminary report submitted to the turnpike authority by Edwards, Kelcey & Beck, Newark, N. J., engineering firm.

• **Detroit and Bay City**—Surveys, meantime, are being made by Coverdale & Colpitts, New York, and J. E. Greiner Co., Baltimore, on the feasibility of the proposed $100-million, 102-mi turnpike linking Detroit to Bay City.

Planning for a third Michigan toll road venture—the Detroit-Toledo project—which would cost an estimated $80 million is stymied. The state highway commission previously had announced plans to route a $20-million freeway between Toledo and Monroe. Turnpike authority suggestions that the proposed freeway be made a toll road, thereby freeing the $20-million allocation for other uses, met objections from Monroe and other communities along the proposed route.

Engineering examiners' group names officers

Stanley G. Palmer, dean of engineering at the University of Nevada, has been named president of the National Council of State Boards of Engineering Examiners. Installation took place during the group's recent annual meeting in San Antonio, Tex.

Other new officers installed include: J. W. Gore, Baltimore, Md., vice-president; A. L. Jones, West Orange, N. J., director, northeast zone; E. D. Dake, Rapid City, S. D., director, central zone. Three officers were held over: past president, A. G. Stanford, Atlanta, Ga.; director, southern zone, J. H. Sams, Clemson, S. C., and director, western zone, Allen S. Janssen, Moscow, Idaho.

A local water district goes it alone

After county efforts bog down, California unit votes bond issue of $10 million to finance its own development

The United Water Conservation District in Ventura County, Calif., is a good case study of the problems that can beset a local water resources development enterprise, particularly in respect to harmonizing its program with regional aims and requirements.

Covering only a fifth of Ventura County—although accounting for half the irrigable acreage with 25% of the assessed valuation—the United Water Conservation District voted a $10.9-million bond issue in late October. The district hopes to call for bids for a storage dam by next spring. It has the basic plans, but must complete working drawings and sell its bonds.

Funds will pay for an $8-million earth and gravel dam at Santa Felicia on Piru Creek, a tributary of the Santa Clara River, plus new spreading grounds, wells, pumps and diversion lines. Consultant for the program is Julian Hinds, former chief engineer for the Metropolitan Water District of Southern California.

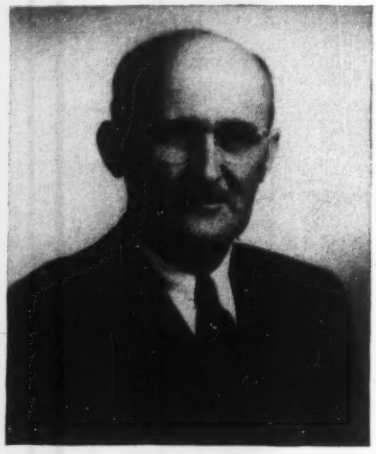
The bond issue, calling for purely local development, was approved just three weeks after the California State Water Resources Board issued a report insisting that an integrated county-wide system is a necessity.

That the county has a serious water problem has long been recognized. As long ago as 1927, the State Water Resources Board was called upon to survey the situation and make recommendations. Numerous surveys have been made since but little has been accomplished.

• **Confusion**—A County Flood Control District was set up in 1944 and it built one reservoir (ENR June 10, 1948, p. 96). But the Flood Control District has been hampered by the nature of its organization. It is divided into four zones, each of which raises and spends its own money.

Discouraged as to action on a county-wide scale, the richest two areas formed their own water districts: United, which includes fertile agricultural land in the Santa Clara Valley and the Oxnard Coastal Plain; and Ventura Municipal Water District, covering the area around the city of Ventura and the Ojai Valley.

In 1951, a contract was negotiated between the Flood Control District and the state for an investigation by the State Water Resources Board. To cost $60,000, the survey was to be financed half by the state and half by the county.



JULIAN HINDS—Consultant for water resources program in California.

But, United and then Ventura also went ahead with their own plans. Ventura has contracted with the Bureau of Reclamation for a study, now under way and due for completion next summer. And, United already has come up with its proposal.

• **The big picture**—The problem is the same, whoever attacks it, and it is a serious and urgent one. The northern half of the county is rugged, mountainous terrain with little agricultural development and plenty of water. The southern half is well developed and short of water. All areas have serious overdrafts on underground supplies. Ventura's supplies were so low as to require stringent regulations on water use during the dry year of 1951. The aquifer in the vicinity of Port Hueneme (site of the Navy base) has been invaded by sea water.

There is a general opinion that the immediate situation could be remedied, without water imports, by conservation of local supplies. There also is agreement on possible reservoir and dam sites.

However, there are points of disagreement that keep the United plan from being the logical first step toward the county-wide plan suggested by the State Resources Board. The state engineers included the Santa Felicia site in one of their six alternative plans, but not in the one they recommend as most satisfactory.

This difference is partly indicative of the difference in approach between consideration of one area as against the entire county. The state report recommends, instead of the Santa Felicia site, a reservoir at Devil's Canyon, a point higher up Piru Creek. Whereas Santa Felicia will hold 100,000 acre-ft, Devil's Canyon would hold 150,000, and this additional capacity could be used for supplementary supply to the Calleguas-Conejo region, which has no local supplies of its own to develop. Development of Santa Felicia will render the Devil's Canyon site unusable. But strictly from the standpoint of the United District, the difference in cost—$8.5 million for Santa Felicia as against $15.5 million for Devil's Canyon—isn't worth it.

Even so, it will not be impossible to tie in the United project with the state plan, if adopted. Another site above Devil's Canyon could be developed for 50,000 acre-ft, giving the total of 150,000 acre-ft called for in the state plan.

That's what makes even proponents of a county-wide program take a cheerful view of United's success with its bond issue.

Power potential probed in Upper Klamath Basin

The Reclamation Bureau's California projects office in Sacramento has announced that a "reconnaissance study" of the Upper Klamath Basin in Oregon has turned up a possible plan for development of the power potential of the Klamath River between Keno and Copco Lake.

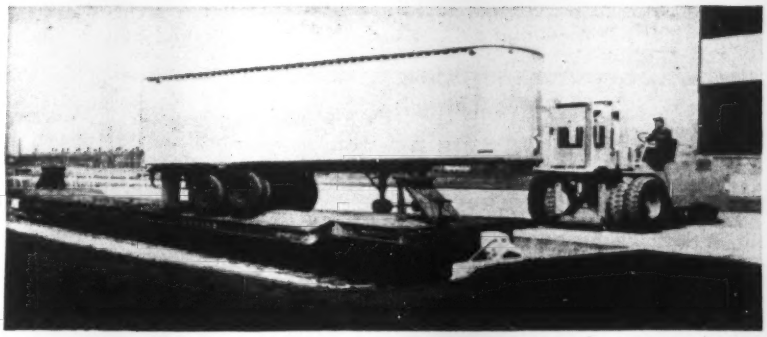
The plan would lift river waters 200 ft for conveyance via a multi-purpose system through Butte Valley, then tunnel them back to the Klamath River canyon where 1,400 ft of head would be developed by a Shovel Creek power plant.

After the report was issued, bureau officials emphasized any power plan is "very tentative." The bureau emphasized the reclamation agency's comprehensive report on the findings of the Upper Klamath Basin investigation will not be completed at a field office level until the middle of 1954.

Belgium steel imported to speed bridge job

Steel beams imported from Belgium are being used in the construction of anchorage pier foundations for the $90-million, seven-lane Delaware River bridge from Philadelphia to Gloucester, N. J. (ENR June 11, p. 23; July 23, p. 27).

Merritt-Chapman & Scott, who hold a $3.4-million contract for this work, turned to Europe when it became apparent that U.S. mills could not roll the beams in time to meet contract specifications.



SIDE LOADING a truck semi-trailer on the new trailer-transport car. A modified hydraulic lift truck is used for this movement. Each trailer is held by the shock-absorbing end stanchion in which its king-pin rests and by adjustable hold-downs near the rear axles. The ridge along the car's center also helps to prevent side movements.

New flat car designed to facilitate coordination of rail and truck hauls

A new attempt to combine railroad and highway transportation has been launched by the Electro-Motive Division of General Motors. It has designed a rail car that will carry two standard semi-trailers (35 ft) instead of one as heretofore.

Also, the car is designed to permit side loading with a hydraulic lift truck, either from a low (29-in.) platform or to cars on tracks depressed below the level of a loading terminal yard.

The car is 75 ft long, or about 30 ft longer than a standard flat car but about the length of a modern coach, so it introduces no special clearance problems on curves. A stanchion is located near each end to engage the king-pin of the semi-trailer. This stanchion is equipped with a rubber shock absorber, which permits a movement of the trailer 4½ in. in each direction longitudinally to reduce shock to trailer contents when brakes are applied. There also are adjustable hold-down struts for added security.

In the past, attempts to combine rail and road movements by loading trailers or semi-trailers on flat cars have not been very successful, due in part to the fact that only one could be loaded on a standard flat car. Interchangeable containers have been tried, but their usefulness was limited by the fact that special gantry cranes were required for transfer of the container units from truck bodies to cars and from cars to trucks at the other end of the movement.

Engineers of the Electro-Motive Division believe that real economies can be obtained with the cars carrying two semi-trailers where trip distances are over 300 miles.

Pullman Standard Mfg. Co. also has entered the field.

Shipwreck provides concrete test

Results of a shipwreck investigation proving the resistance to salt water corrosion of expanded shale concrete; and a report on use of corrugated paper box forms in waffle slab concrete construction highlighted the recent sixth regional meeting of the American Concrete Institute at Houston, Tex.

The intriguing story of the Selma, whose concrete hull has been lying in Galveston Bay for 30 years, was told in a paper by Ralph B. Rogers of Dallas, Tex. The ship, launched at Mobile, Ala., in 1919, was the first concrete vessel to be built. Expanded shale aggregate made in rotary kilns had been used in the high strength reinforced concrete hull. After three years of service the ship was struck by a tug and the cracked hull was towed out into Galveston Bay and sunk.

This year the Engineers Testing Laboratory of Houston, Tex., investigated the hull. They found that its smooth ⅜-in. round reinforcing bars were still in excellent condition and that the concrete and the bond were normal in every respect.

At a depth of ¼-in. from the outside of the hull, the concrete appeared to be dry and had not developed cracks or discoloration. Compressive strength of the concrete determined from a 2-in. cube taken from the hull, was found to be 13,181 psi.

• **Re-usable paper forms** – The feasibility of corrugated box forms in concrete construction was detailed in a paper by H. C. Pfannkuche, Fort Worth, Tex. In a four-story dormitory at Southwest Union College, Keene, Tex., paraffin-coated boxes stapled to soffit boards, were used for the 2nd, 3rd, 4th floor and roof waffle slabs. The first floor is a concrete slab on ground. Concrete for the second floor was placed by dump bucket and crane, but for the upper slabs concrete from a hoisting tower was carried in buggies along runways.

The runways lay right on top of the corrugated box forms: no trestles were required to distribute the buggy loads. With care, it was posible to re-use the forms three times. The boxes, supplied by the Southwest Corrugated Box Co., Fort Worth, are formed from a corrugated board which will stand compression up to 600 psi.

Ohio agency prepares road classification

About 6,000 mi of Ohio highways will be designated as major thoroughfares in the official road classification which will be released next week by the state's three-member highway construction council.

The council was created by the last session of the Ohio legislature to draft a highway construction priority list and supervise expenditures of new highway levies, including an axle-mile tax designed to yield $20 million annually and a gas tax increase totaling $23 million a year (ENR July 23, p. 23).

The State Highway Department will submit major highway projects to the council by Dec. 1. By the end of the year, it will have plans completed for $80 million of work for the next year.

Voters' approval of a $500-million bond issue last week will spur the Ohio roadbuilding program (see page 21). The bonds are to be issued at the rate of $125 million per year for four years and are to be retired by axle-mile tax.

A reorganization of the State Highway Department, also provided for in the comprehensive highway improvement program adopted by the last legislature, was implemented last week. State Highway Director Samuel O. Linzell named four deputy directors to head four new bureaus for planning, construction, maintenance and administration.

The appointees, each to receive a salary of $11,280 per year, are: John W. Keefe, Cincinnati attorney and executive secretary to Gov. Frank J. Lausche, administration; John J. Heier, chief engineer of old Division of Planning and Programing, planning; C. W. McCaughey, a highway department employee since 1931, maintenance; H. F. Gerold, Rear Adm. (Ret.) of Sandusky, construction.

Survey shows engineers' thinking about collective bargaining issue

The American Society of Civil Engineers has looked into the minds of its members to find out how they feel about collective bargaining.

There's little doubt that civil engineers are concerned about the old issue of unionization: More than 53% of the 32,221 ASCE members who received quesitonnaires answered them and sent them back.

• **What the members think**—Feelings about unionization among engineers are, as nearly everyone suspected, influenced by age, experience and degree of supervisory responsibility. Junior members were more inclined than their elders to favor collective bargaining.

Of those who believed collective bargaining to be advantageous an overwhelming majority—3,881 to 169—said that they would prefer representation by a professional bargaining group to affiliation with a craft or labor union. Only 624 of the 17,203 members who replied were already members of established collective bargaining groups.

Of the junior members, a smaller percentage replied to the questionnaire than in the case of older members, although collective bargaining is of more direct interest to younger engineers. But, of the 7,000 juniors who did reply 3,000—close to half—said they were not opposed to collective bargaining.

Observers were surprised to learn that nearly half of 6,743 older engineers—members and associate members—were not opposed to collective bargaining.

What the ASCE did not attempt to determine in its survey was how many of its members were members of so-called "non-bargaining" groups which were so much in the limelight last spring, and which probably will be given national attention next year.

• **Lawmakers' delight**—When Congress convenes in a couple of months, it will find three groups ready to beseige it with three views on how the Taft-Hartley Act should be amended—or left unchanged—to handle the ticklish issue of collective bargaining by engineers.

The three groups—and their views:

• National Society of Professional Engineers has sought to have Taft-Hartley changed to remove any cloud of illegality from informal bargaining procedures which have become common between "non-bargaining" groups of engineers and large corporations that hire many engineers.

• Engineers and Scientists of America wants informal bargaining labeled illegal, insisting that discussions of pay and working conditions should be handled by legally recognized unions. ESA is made up mostly of groups of engineers employed in the aircraft, electrical and mechanical industries, ESA draws few members from civil engineering.

• American Society of Civil Engineers opposes pressuring Congress for T-H changes. It thinks the act as it now stands gives engineers ample protection.

The study of current thinking about collective bargaining for engineers is in line with ASCE's practice over the last 20 years. The society was the first to set up a committee to make a realistic study of the unionization movement among engineers, and the first to conclude that unionization was basically an economic question.

Following passage of the Wagner Act, when engineers found themselves forced into unions in which they had little or no voice, the society helped some of them to organize collective bargaining groups as a defensive measure. Still later, it took an active part, along with the National Society of Professional Engineers, in drafting provisions of the Taft-Hartley Act which give engineers and other professional groups the right to separate bargaining representation.

63% of reporting members oppose collective bargaining

Membership grade	% opposed . . .	. . . because of incompatibility with professional status	. . . for other reasons
Junior members	56	49	12
Associate members	64	58	10
Members	72	68	8
Affiliates	35	35	6
All reporting members	**63%**	**58%**	**6%**

24% of reporting members believe collective bargaining is, or would be, advantageous

Membership grade	% reporting collective bargaining advantageous and . . .	. . . prefer professional bargaining group	. . . prefer craft or labor union
Junior members	32	30	1.4
Associate members	23	21	0.9
Members	15	13	0.5
Affiliates	47	41	6.0
All reporting members	**24%**	**23%**	**1.0%**

Extortion charged

Investigation of union fund payments resulted this week in the indictment of New York labor leader William C. DeKoning, Sr., and five other men by a Nassau County grand jury on charges of extorting $360,000 from Long Island building contractors.

The six men were accused of forcing builders who employed union labor to contribute $8 to DeKoning's union (AFL operating engineers) for each home they constructed in the county between 1947 and 1949. About 45,000 homes were reported to have been built in that period.

More than 40 builders are said to have testified that the union gave them the alternative of contributing money to its welfare and defense fund or hiring a union member to supervise concrete mixing operations. With the standard wage for such laborers rated at $16 a day, builders invariably chose to donate the $8 payments.

The grand jury will convene again on Nov. 19 to continue its investigations.

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Igloos and ammunition magazines require forms for multiple use and quantity production. It is important to use a design that permits ease of stripping and which incorporates mechanical moving devices. Here again our special procedures for these thin wall structures have enabled us to design forming systems that reduce forming costs to a minimum on this type of job.

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The production of precast concrete piles requires forms that allow for fast quantity production. Here again mechanical handling and fast stripping are important factors. Each form problem requires a different approach to obtain the maximum economy with consistent accuracy of results. Having designed and supplied forms for many types of precast piles, we are in a position to give you the answer to your problem.

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Bechtel Corp. and ENR staff photos

CAVING SAND, hilly terrain, swampy land, peat bogs, quicksand, and solid rock are all in a day's work on the 643-mile Superior-Sarnia pipe line. It will furnish a . . .

Petroleum by-pass for the Great Lakes

Pipeline construction has been mechanized to the *n*th degree.

At first glance the job appears simple: Dig a shallow trench; weld, coat and wrap the pipe; lower it into position; backfill, and clean up the right-of-way.

But a few days spent with a pipeline crew quickly dispels any idea that theirs is a humdrum operation. Mother Nature continues to bedevil and harass any venturesome contractor tackling a pipeline construction job.

• **A variety of trouble**—Prolonged rains can tie up the job and wreck construction timetables. Grassy meadows can turn out to be swamps; virgin forests often shelter peat bogs; quicksand or solid rock can be found where least expected. Moreover, speed is invariably of the essence—especially where large mileages of pipe must be laid in a single construction season.

Such is the case on the Lakehead Pipe Line Company's fast-moving 643-mile, $75-million pipeline project being rushed to completion this year between Superior, Wis., and Sarnia, Ont. One Canadian and seven U. S. contractors are laying the line—all of which is welded steel pipe 30-in. OD except twin 20-in. lines across the bottom of the Straits of Mackinac (ENR Aug. 13, p. 22 and Sept. 10, p. 43).

• **Completed this year**—The completed pipeline—expected to be in operation around the end of this year—will be an extension of an existing 1,130-mile line running from Edmonton, Alberta, Canada, to Superior, Wis.

It will permit year-around delivery of Alberta crude oil to the Sarnia refineries and delivery points in Michigan, eliminating a five-month shipping bottleneck during the winter when tankers can't operate on the Great Lakes. The U. S. portion of the Edmonton-Superior line is owned and

ICEBOUND GREAT LAKES won't prevent the transportation of crude petroleum from Alberta, Canada, to the Sarnia, Ont., refineries. It will be pumped the year-around through the present 1,130-mile Interprovincial-Lakehead line and Lakehead's new 643-mile Superior-Sarnia extension.

operated by Lakehead; the remainder, by its Canadian parent company, the Interprovincial Pipe Line Co.

• **100 miles of swamps**—More than 100 miles of the 643-mile route cuts through swamps. About 200 miles goes through open lands, of which slightly less than half are under cultivation, and about 140 miles of line is in heavy forest. Over 10% of the trench excavation is in rock, 55% is sand and gravel, 15% is sandy loam, 15% is clay and 4% is clay and boulders.

Cold statistics aren't too impressive, but someone has calculated that it will take 153,000 tons of steel to make the required 639 miles of 30-in. welded steel pipe. It is believed to be the largest diameter petroleum pipeline in North America, and forms one of the longest: the 1,773-mile total length is equal to the airline mileage from Chicago to Los Angeles. Average cost of the land section of pipe is about $100,000 per mile.

In addition to the costly Mackinac Straits crossing, the 30-in. line crosses beneath four navigable rivers (St. Clair, Saginaw, Indian and Nemadji), 41 other rivers, 47 railroads, 46 state and federal-aid highways, 75 principal county roads where the pipe must be installed in casings, and a multitude of other local roads.

When Lakehead decided to launch this undertaking—rated as gigantic even for the petroleum industry—it employed Bechtel Corp. as its agent for the design, supervision and coordination of all construction.

• **Nine contractors; 12 contracts**—Nine contracting firms hold 12 construction contracts for the entire project. In awarding the contracts, the U. S. portion of the land-sections of pipeline was divided into seven "spreads," ranging in length from 78 to 100 miles (see table). The seven contracts were awarded to five U. S. contractors.

Two contractors have two spreads each, totaling 193 miles and 175 miles, respectively, and the other three contractors have one spread each. The five other contracts include the eight-mile Canadian section of land line, three major water crossings, and a pumping station at Superior.

While ground survey crews were following up preliminary photogrammetric surveys early this year, Bechtel's engineers prepared designs. Wall thickness of the 30-in. land sections of pipe vary from $\frac{3}{32}$- to $\frac{3}{4}$-in. Pipe at major river crossings is $\frac{1}{2}$-in. thick, encased in concrete.

After the pipe designs were fairly well advanced, Lakehead decided on a change that would permit pumping a heavier petroleum than originally planned. This necessitated much redesign, shifting of pipe from one railhead to another, and slowed up some of the installation.

WELDING CREWS toil in the blazing sun, adding mile after mile of 30-in. pipe to the line. Batteries of skid-mounted welders (above), followed by two-man welding teams (below) make the four passes needed to weld each pipe joint.

The pipe was purchased by Lakehead from the fabricating companies and delivered to railheads selected by the contractors. From there, the contractors took over; stringing the pipe along the 60-ft right-of-way and completing the job, which includes: Ditching, bending pipe to fit the contour of the land, welding the 40-ft random lengths together, cleaning and priming, coating and wrapping, lowering-in, backfilling and cleaning up.

• **Slow start, fast finish**—Rain, mud and bad weather got most of the pipe-laying crews off to a slow start last spring. By the middle of June total production of the five contractors on the 630 miles of the 30-in. land-section of pipe stood at only 5 miles completed, 20 miles ready to be installed, 50 miles of ditch completed and 140 miles of right-of-way cleared and graded.

By the Fourth of July, however, total production stood at: 100 miles of pipeline completed, 120 miles ready to be installed, 140 miles welded ready for treatment, 160 miles of ditch completed and 280 miles of right-of-way cleared and graded.

Construction operations hit an even faster tempo during August and September with each pipe-laying spread doing its best to outdistance the others. The construction contracts contain no penalty clause for failure to finish on schedule, and none is believed necessary. Completion of the work before bad weather sets in this fall, increasing construction costs, is believed to be ample incentive for the contractors to keep their crews working 10 to 12 hr per day, 7 days per week.

• **Ditching**—The land sections are being buried in narrow trenches, excavated to a minimum depth of 5½-ft to furnish a 3-ft minimum cover. Various types of excavating equipment are used; trenchers, back hoes, small shovels, clamshells and even draglines—all depending on the type of material and working conditions.

The general plan is to bury the pipe in a constant-depth trench, bending it as needed to fit the contour of the ground surface. Although the number of bends required may run as high as 50 per mile, this method is considered faster and cheaper than varying the depth of trench to minimize the amount of bending.

Me? Ride to work on wire rope?

That's right. In the course of a year this young lady may travel as much as 150 miles with the aid of wire rope that safely and swiftly whisks her elevator aloft and then just as safely returns it to ground level. It's quite likely that she gets to her job with an assist from Wickwire Rope. Here again—as in so many other fields where wire rope is used—men who manage and maintain the nation's tall buildings have learned to place unbounded faith in the safety and reliability they get from Wickwire Rope.

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Twin Clay Pipe Sewer Carries Acid Wastes From 5 Big Monsanto, Ill. Plants

This twin sewer, constructed with 36-inch Vitrified Clay Pipe, carries acid and other chemical waste from plants of Monsanto Chemical Co., Socony-Vacuum Oil Co., American Zinc Co., Darlington Fertilizer Co., Midwest Rubber Reclaiming Co. and other companies in Monsanto, Illinois. The sections of Clay Pipe are jointed with hot-poured bituminous jointing compound.

Acid and chemical waste from local industries was the disposal problem in Monsanto, Ill. Engineers considered using various non-clay materials for the line, but none of these substitutes offered the *permanent protection against corrosion* that only Vitrified Clay Pipe can give. Rather than risk building a single large-diameter sewerage line of substitute material, the engineers designed and built a twin line of 36-inch Clay Pipe.

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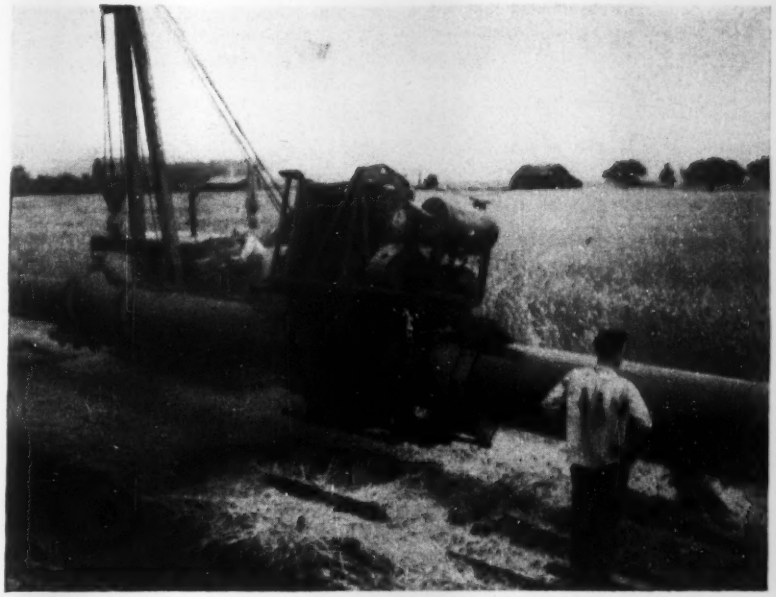
Track-mounted bending machines bend the pipe to the proper curvature after it has been strung out along the right-of-way. Side-boom tractors, generally handle the line with special lifting slings.

• **Welding**—It takes a lot of welding rod and a lot of man-hours to weld the sections of 30-in. pipe into a continuous line. The pipe is welded together with a single-V butt weld, having a $\frac{1}{16}$-in. root. Four complete passes are made around the pipe: A root pass, hot pass, filler and a cap weld. This calls for three kinds of welding: downhand, vertical and overhead.

Techniques vary between jobs, but one welding outfit makes the root pass with a battery of three 300-amp. shield-arc welding machines mounted on a truck.

The hot pass is made by a battery of four welding machines mounted on a tractor-pulled skid; while the filler and cap welds are made by eight two-man teams (welder and helper). Normally about 24 men comprise the two crews making the root-pass and hot-pass welding.



WHILE SIDE-BOOM TRACTORS cradle the pipe in special slings, two self-propelled machines clean and prime-coat it (above), then apply a protective coating of coal tar base enamel and two spiral wrappings of glass fiber cloth (below).

• **Cleaning and priming**—With the welding of a stretch of pipe completed, the job gets more mechanized. Next step is to clean and coat it with a prime coat of coal tar base enamel.

One machine does both operations in a single continuous pass. This self-propelled machine, which runs along on top of the pipe, is equipped with a set of high-speed rotating cutters and wire brushes which remove all rust and dirt, followed by a rotating mechanism which applies the prime coat. It is balanced by a steel-frame outrigger with a single pneumatic tired wheel at its outer end that rolls along on the ground. A side-boom tractor traveling just ahead of the cleaning and priming machine keeps the pipe swung clear of the timber blocking on which it normally rests. Special slings and cradles for supporting the pipe have two sets of double rollers that roll along beneath the pipe.

An average crew can clean and prime about 3 miles of the 30-in. pipe in 10 hr. Workmen with brushes touch up any spots that are missed with the priming machine.

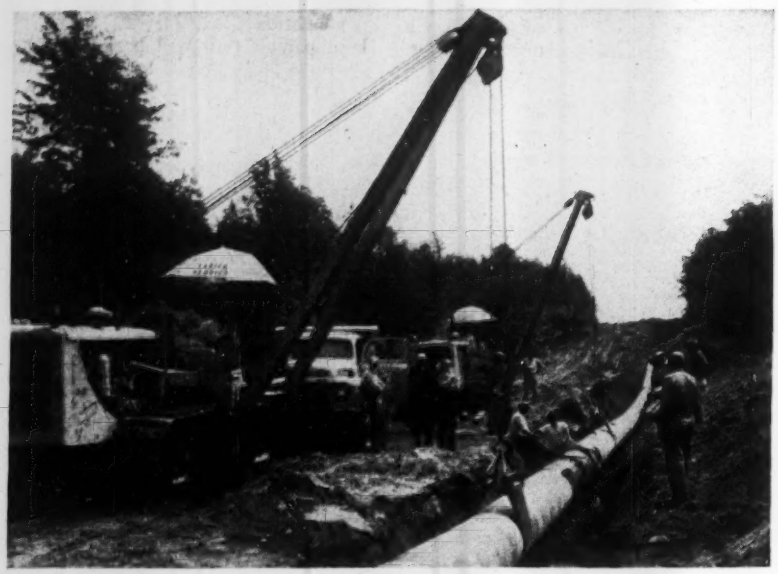
• **Coating and wrapping**—The next step, also highly mechanized, is coating and wrapping, by another self-propelled machine traveling on top of the pipe. It applies a heavy coating of coal tar base enamel under pressure and two spiral wrappings of glass-fiber paper and cloth, in one continuous operation. One man walking along at the end of a 20-ft "Hoosier" pole attached to the dope-and-wrap machine keeps it balanced as it travels along the pipe. A good 10-hr run of the machine will dope and wrap $1\frac{1}{2}$ miles of the 30-in. tube.

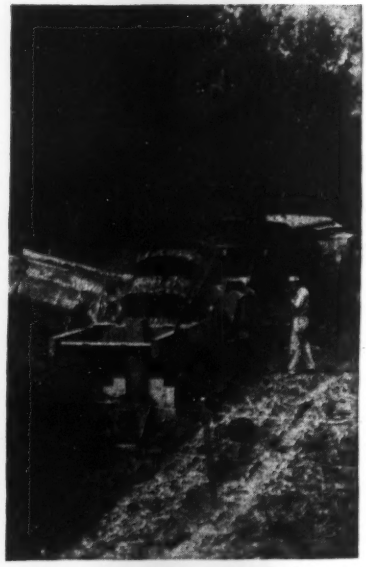
Both the glass-fiber paper and the glass-fiber cloth come in 150-lb rolls that can quickly be slipped onto spindles projecting out from a large gear-driven wheel that does the wrapping. The coal tar base enamel, or dope, is applied at a temperature of about 485 deg F. It is fed to the machine through a metallic hose running to a track-mounted dope pot that is pulled by a tractor.

These dope pots hold 25 bbl of dope, which weighs 600 lb per bbl. They are spotted at 1,600 ft along the 60-ft right-of-way and have mechanical agitators and gas-fired heaters to keep the enamel ready for application. About 40 men make up a combined cleaning and priming and doping and wrapping crew.

• **Testing**—The pipe undergoes two tests before being lowered into the trench. An X-ray machine tests the welded joints and a "holiday" tester spots any areas of the pipe not properly coated with the dope.

Not all joints are X-rayed. General





WELDED, COATED AND WRAPPED, the big 30-in. pipe is carefully lowered into its trench (at left). Trencher (at right) claws its way through a stretch of mucky forest, assisted by a tractor in the lead.

practice is to check all joints at railroad and road crossings and in areas adjacent to homes. For the rest of the pipe the usual procedure is to X-ray 20 or 30 joints, then skip a few.

The X-ray machine, which travels inside the pipe, is operated by remote control. It is self-propelled and can travel up to 2,000 ft inside the pipe, making full 360-deg X-rays of any of the joints. The X-ray film is wrapped around the outside of the joint, and each film is developed on the job in a portable dark room.

Surprisingly few joints require cutting out and rewelding. One welding outfit reported only 14 imperfect joints in 27 miles of welded pipe.

The holiday tester is a simple, but ingenious device for detecting any areas of pipe not properly coated. It is a flexible metallic band, encircling the pipe, and rolled along by hand. It operates on an electric circuit to a small truck moving slowly along beside the pipe.

When the tester rolls over an area of pipe that failed to get coated with dope, an electrical circuit is set up, ringing a bell on the truck. Workmen then strip the wrappings from that area, apply hot dope and two layers of wrapping by hand.

SUPERIOR-SARNIA PIPE LINE: CONTRACTS AND CONTRACTORS

Land Sections:

Spread No.	Location	Length (Miles)	Contractor	Superintendent
1	Superior-Ironwood	91	Mahoney Contracting Corp., Lansing, Mich.	Henry Mogg
2	Ironwood-Crystal Falls	100	Anderson Bros. Corp., Houston, Tex.	Rusty Killingsworth
3	Crystal Falls-Cooks	93	Anderson Bros. Corp Houston, Tex.	Aldress Kilgore
4	Cooks-St. Ignace	93	Midwestern Constructors, Inc., Tulsa, Okla.	Wm. Wilhite
5	Mackinaw City-Red Oak	78	Bechtel Corp. (Pipe line Division), San Francisco	Maurice Roberts
6	Red Oak-Bay City	87	Conyes Construction Corp., San Pablo, Calif.	Al Poggi
7	Bay City-Port Huron	88	Conyes Construction Corp., San Pablo, Calif.	Morse Norwood
	Port Huron-Sarnia	8	F. E. Shaw, Ltd.	
Water Crossings:				
	Mackinac Straits	4	Merritt-Chapman & Scott Corp., Cleveland, Ohio	Joseph Troxell
	Saginaw River	0.5	W. J. Meagher & Sons Inc., Bay City, Mich.	J. C. Meagher
	St. Clair River	0.5	Midwestern Constructors Inc.	Carl Stanley
	Total	643		
Pumping Station:				
	Superior		Walco Engineering and Construction Co., Tulsa, Okla.	Jim Peevy

• **Coordinating the work**—With every phase of the pipe line construction geared to a high speed in order to finish the job this season, coordinating the work is a big undertaking.

All coordinating and expediting is done out of Bechtel's headquarters offices in Saginaw. A big wall chart in that office has 15 separate operations for each of the seven spreads, with colored strips indicating work done each month.

The operations are: Survey, optioned, title ordered, title received, easement, clearing, grading, stringing, trenching, line-up, welding, treating, lowering-in, backfill, and cleanup.

During the peak of their activities the Bechtel Corp. had 300 field and office personnel assigned to the project.

• **Men in charge**—T. S. Johnston is president of the Lakehead Pipe Line Company, Inc. R. E. Trammell is

general manager, F. J. Stubbs, assistant general manager; and R. H. Clute, chief engineer.

Clark Rankin is project manager for the Bechtel Corp., reporting to Van W. Rosendahl, senior vice president. R. L. Hamilton is consultant in charge of engineering. Other Bechtel men in charge of operations include: E. F. Quiett and A. M. Berlander, construction managers; J. D. Creveling, lands manager; H. D. Barker, project engineer and J. V. Chambers, administration manager.

Pipe located on map instead of ground

Only 50 miles of the 630-mile Superior-Sarnia pipeline had to be relocated for construction reasons in the field after a skilled layout engineer last winter picked the line's route in the comfort of his office.

Instead of sending several prelim parties to run their trial lines in the North country's cold, Lockwood, Kessler and Bartlett, Great Neck, N.Y., engineers, brought the field onto the drafting table, in the form of aerial photographs and maps.

Photogrammetry has been used for several years in pipeline surveying, but this is one of the first instances where the actual location has been selected on paper.

Here is the procedure:

After field reconnaissance by plane, helicopter and automobile, a three-mile-wide strip was photographed.

Back in Great Neck (and later in Saginaw, Mich.) LKB location engineer Fred Ott inspected stereoscopic pairs of photographs, first pin-pointing the best locations for difficult kinds of work, such as river crossings and populated areas. Then, still viewing the terrain in three dimensions, he selected the detailed location between the critical points by marking trial lines on the photos until he came up with his choice of location.

Geological interpretations of the photographs were made to determine areas where surface rock structures should be avoided.

A full set of planimetric maps then was made from the photographs, showing the chosen location as well as many topographic features like streams, roads, woods, swamps and buildings—all in a mile-wide strip.

Armed with these maps, right-of-way agents began their activities before a single survey party went into the field.

Generally, then, a field party worked on already-acquired right-of-way, thus avoiding the embarrassing access situations that traditionally plague surveyors in cross-country work.

Maps were sized 1 in. to 1000 ft in rural areas and 1 in. to 200 ft in built-up areas. Scale distances were accurate to the width of a sharp pencil point: About 10 ft on the 1000-ft sheet; 2 ft on the 200-ft sheet.

Field parties established pipeline control points by scaling distance and direction ties from prominent map points, like buildings and fence corners. Then they staked out the line. They were permitted to deviate as much as 100 ft to either side of the ordered location, where it was necessary to avoid difficult topographic features that had been missed in the paper location. (But they had to stay in land parcels that had been acquired.)

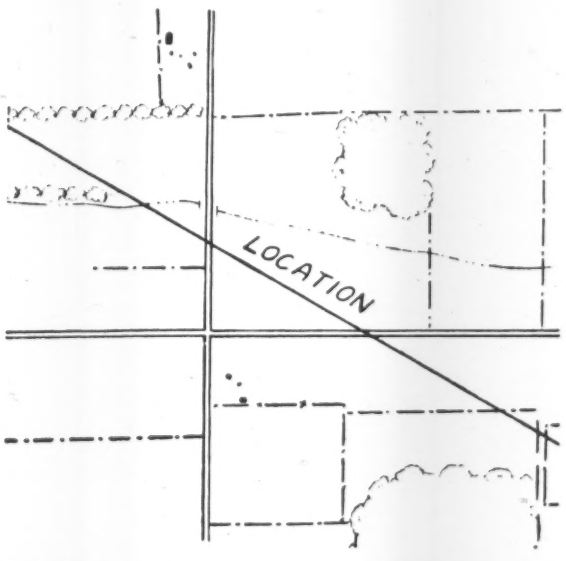
Greater deviations required approval by the pipeline owner's organization, but these were few. One major relocation of 20 miles was necessary to avoid a geologic fault in the upper-Michigan mining country. Another, of 15 miles, took the line around a swampy area that was wetter than it had appeared in early-winter photographs. Other relocations to accommodate unforeseen topographic conditions added up to about 15 miles, bringing these relocations to a total of 50 miles, or less than 8% of the whole line.

As crews staked out the final location they drew the "as staked" line on their map sheets, filled in profile data and made field measurements of various tie distances, also recording them.

In this rush job the mapping process, from reconnaissance to final delivery of maps, showing the proposed location, took from November, 1952 to March, 1953. Map sheets for 220 miles were finished in January; layout parties began work in February.

In addition to the now-accepted time savings that photogrammetry yields in route surveys, on this job one man (the location engineer) working three weeks replaced much of the extra effort that several field parties ordinarily would have had to expend on trial locations. Moreover, his superior location experience and judgment were brought to bear on the whole line, rather than on the few sections he would have been able to cover in normal field work.

President of Lockwood, Kessler and Bartlett is Ford Bartlett. Jack Mitchell was in charge of the project for LKB.



BEFORE survey parties went into the field they had accurate maps with pipeline location on them. This is a full-size sample.

AFTER line was staked out, draftsmen added record information, such as field-measured ties and curve data.

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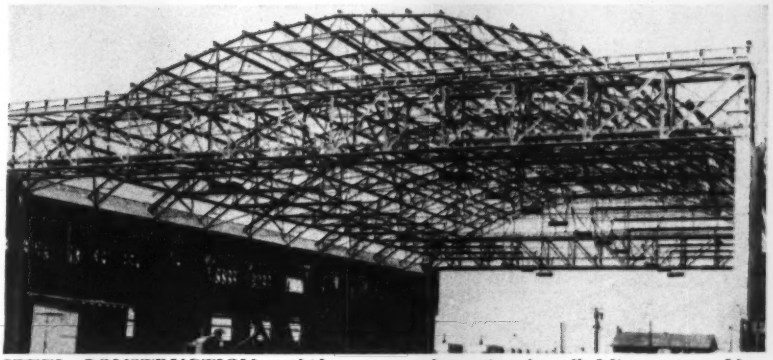
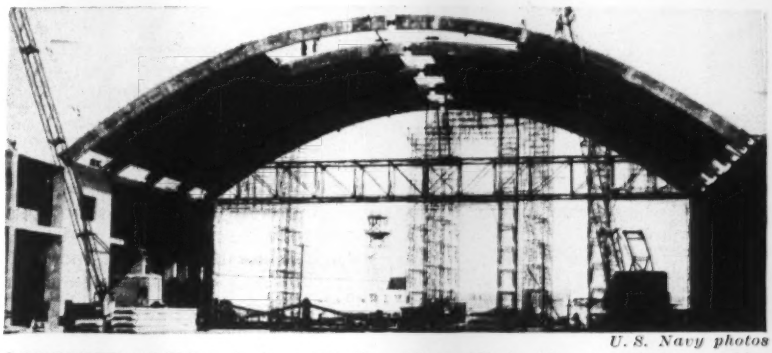


STEEL CONSTRUCTION outbid concrete alternative for all Miramar-type Navy hangars where there was a choice of structural type, but . . .



U. S. Navy photos

CONCRETE ARCHES, built at Whidbey Island, Wash. (above), and Oceana, Va., are of greater construction interest because of careful procedures required in erecting precast half-arches.

PROTOTYPE of standard hangar was this twin-barrel structure at Miramar, Calif., naval air station.

Navy standardizes jet hangar designs

The U. S. Navy is building a series of 150-ft span hangars at several of its air stations. Called jet aircraft maintenance hangars, all have the dimensions of two hangars at Miramar Naval Air Station in California. But arches and roofs are either concrete or steel, most of the contracts having been advertised with bidding permitted for use of either structural material.

In each case where alternative bids were called the steel-arch was bid lower. However, at Oceana, Va., the award was made in concrete because of such factors as high maintenance costs for steel in exposed location. At Whidbey Island, Wash., there was no steel alternative, and at Argentia, Newfoundland, concrete was omitted from the bidding.

The arches are mounted on 40-ft-high yielding abutment bents. The concrete bents are called "yielding" because a differential settlement of ¾ in. is permitted between their edges, which are 31 ft apart. Such settlement would transfer bending moment from the abutments to the fixed arches, which in turn are designed for that moment.

The Navy standardized designs at the various locations in order to improve operational efficiency. Basic criteria provided two hangar areas each 150 ft wide by 240 ft long. The hangars have 40-ft clearance under a bridge crane system and 40-ft clearance at each door. The abuments frame leanto space for shop and service functions, and in addition there is a central shop area between the inner abutments of adjacent hangars. Only one hangar bay is included in present construction at some of the air stations but all include the central shop area.

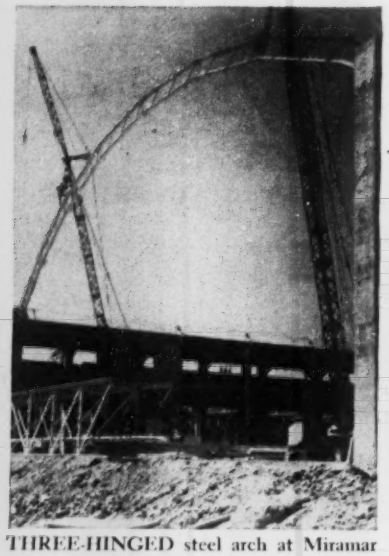
The architect-engineer for the prototype Miramar hangar—Kistner, Wright and Wright (then Kistner, Curtis & Wright) of Los Angeles—made comparisons between different building types in the course of preliminary studies. Under consideration were prestressed concrete types, rigid steel frames, rigid concrete frames and thin-shell types as well as the concrete design that was chosen. This design has fixed, precast concrete arches. It calls for precast concrete slabs for roof and floor areas.

• **Steel added**—In addition, however, an alternative design was prepared using welded steel arch trusses and metal roof decking.

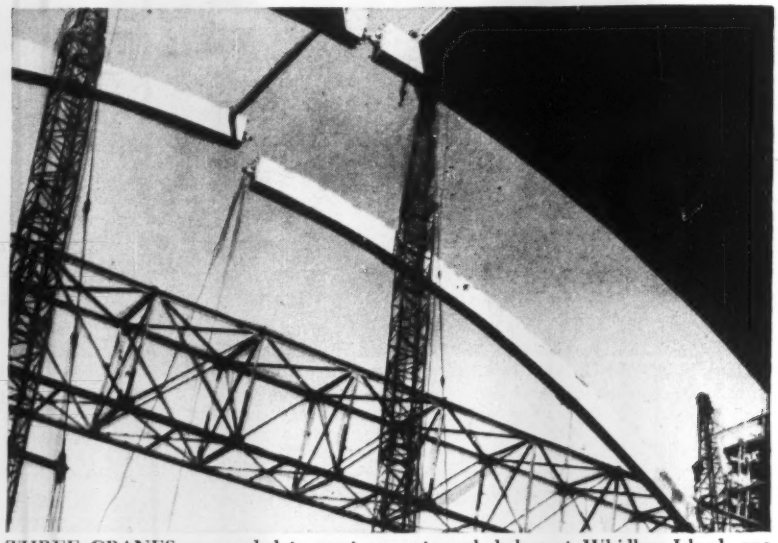
The fixed-arch design was adopted because it would involve less material than would a hinged-arch design. For design purposes, the worst possible abutment movement was assumed at ½ in. This was made up of abutment deflection and settlement. For concrete arches spaced on 24-ft centers the following forces (dead load plus 15 psf live load) were computed at the abutment-arch joint: vertical load, 149 kips, horizontal load, 168 kips, and moment, 520 ft-kips.

Resulting from these criteria are hollow concrete arches 3 ft deep by 1½ ft wide. They are parabolic in form and rise 29¼ ft from abutment to midspan. Maximum reinforcement is ten 1¼ in. square bars at the top and ten 1¼-in. square bars at the bottom. This occurs near the abutments. Minimum reinforcement is six 1¼-in. bars, at the crown.

The abutments are reinforced concrete rigid frames that are rectangular in shape. A horizontal strut supports the second floor and provides addi-



THREE-HINGED steel arch at Miramar is erected in one piece by two cranes.



THREE CRANES are needed to erect concrete arch halves at Whidbey Island; one holds first half while two lift second. Hinges will be made rigid after 30 days.

tional lateral bracing. Abutment joints are launched for moment transfer.

• **Rigid after 30 days**—Limitation of settlement in the abutments to ¼ in. under such loading might seem to be unduly restrictive, particularly in view of varying load combinations during construction. For this reason the arches in both steel and concrete designs are constructed as three-hinged units until 30 days after full dead load is on them. Then rigid connections are made. The settlement limitation imposed in design starts when the arches are fixed. (In the Miramar case there has been no noticeable settlement of the abutments after several months service.)

For the concrete arches, hinges are provided at the abutments for erection. To convert to fixed arches, reinforcing rods are welded to dowels extending from the abutments and the arches. Then the entire connection section is encased in concrete. At the crown a similar hinged joint is converted to a fixed joint by the same method.

For the steel arches also, hinges are provided at the abutments and at the crown. The abutment hinges are pin connections at the bottom chord of the light steel truss. When the time comes for converting to fixed condition the top chord is rigidly connected to the abutment as follows: A stiffened 12-in. WF section is bolted between the top chord and the abutment; the remaining space between the WF and the abutment concrete is dry-packed with a mortar mix. At the crown the lower chord is left unconnected; later it is shimmed between chord-member ends and bolted to provide fixity.

• **Half-arches cast**—The fixed concrete arch would not have been deemed competitive if the concrete had to be poured in place. That's another reason for treating it as a 3-hinged arch during construction. The 3-hinge approach permits casting half-arches on the ground so they can be raised into position later. Plans suggest detailed procedure for this erection operation, but the contractor is free to devise other step-by-step methods subject to engineer approval.

The hangars under construction at Oceana, Va., and Whidbey Island, Wash., are the only ones to date awarded in concrete. The procedure used at Whidbey Island is described at the end of this article. The principal difference between Whidbey Island and Oceana procedures is the casting position of half-arches: On their sides at Whidbey Island; in a vertical plane at Oceana. The vertical casting position was recommended. The side casting method is easier, but it calls for ticklish hoisting in order to rotate the half-arch to erection position.

• **Management** — The jet aircraft maintenance hangars are under the jurisdiction of the Bureau of Yards

DESIGN AND CONTRACT DATA

	Miramar	El Toro	Cherry Pt.	Oceana	Cecil Field	Whidbey Island	Argentia
No. 150-ft hangar spans	2	1	2	1	1	1	1
Low bid, steel arch	$3,040,415	$2,178,192	$2,756,988	$2,013,000	$1,854,257	———	$2,420,219
Low bid, concrete arch	3,070,000	2,240,375	3,015,830	2,100,000	2,156,513	$2,169,902	———
Award in	steel	steel	steel	concrete	steel	concrete	steel
Successful bidder	Gunther-Shirley-Trepte	Ford J. Twaits Co.	Henry C. Beck Co.	Virginia Eng. Co.	R. E. Clarson Inc.	Strand & Sons	Ayers, Hagan & Booth, Inc.
Architect-Engineer	Kistner, Curtis & Wright	Kistner, Curtis & Wright	*Kistner, Curtis & Wright	W. W. Slocum Co.	Reynolds, Smith & Hills	Narramore, Bain & Johanson	W. W. Slocum Co.
Roof live load (psf)	15	15	20	20	15	20	40
Wind live load (psf)	15	15	25	25	39	25	31
Allowable foundation load (psf)				4,000	4,000		
Dead load & live load	6,000	**	4,750		5,000	4,000	6,000
Dead load & wind load				5	***	5	8
Earthquake factor (%)	10	10	5				

* Superstructure only, Substructure designed by Reynolds, Smith & Hills. ** 40 tons per pile. *** Wind governs.

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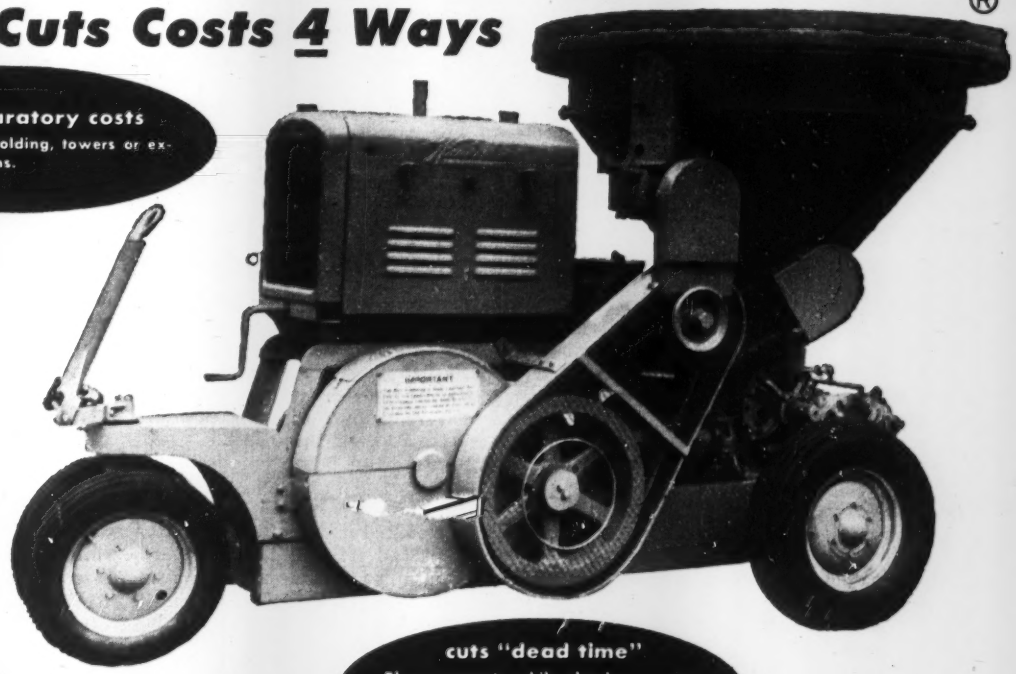

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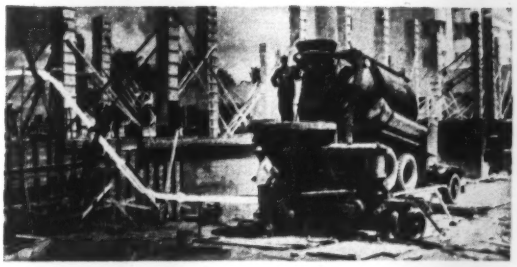

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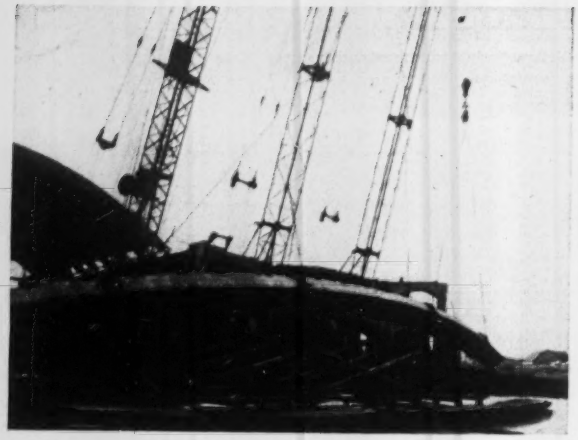


FOUR-POINT PICKUP at Whidbey Island rotates horizontally-cast arch half. It will be set on carriage in foreground.

VERTICAL CASTING position was adopted by contractor at Oceana. Paper forms for hollow space in arch are shown.

and Docks, with Rear Admiral J. F. Jelley, CEC USN, Chief of the Bureau.

The Miramar design, which serves as a prototype, was worked out by Kistner, Curtis and Wright, architect-engineers, of Los Angeles under the direction of the Public Works Department of the Eleventh Naval District, with Captain A. I. Flaherty, CEC USN, as District Public Works Officer. Other architect engineer firms preparing hangar and foundation designs are noted in the table appearing on page 40.

Concrete arch erection at Whidbey Island

Horizontal casting, then careful rotation to vertical position, were features of 150-ft concrete arch erection at Whidbey Island. Bids were asked for concrete arches only.

The half-arches were cast about three months prior to erection, each section requiring 9.1 cu. yds. of 5,000-psi concrete, and weighing about 20 tons.

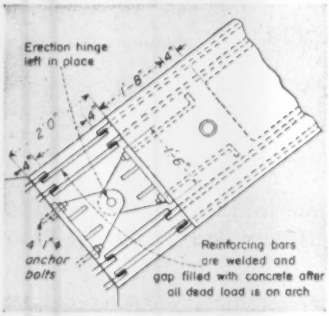
Each section is 1 ft 6 in. x 3 ft x 82 ft 8 in. long, with a hollow center section formed by a hard-surfaced paper form of oval cross-section. The 12 ft at the abutment end of each arch is reinforced with 20 1-1/i-in. square reinforcing bars, as described above.

Arch-halves were concreted on their sides. In pouring, the concrete was forced down one side, under the paper form, and half way up the other side, under external and internal vibration. The paper tube was wired to the bottom of the form and further held in place by steel rods.

• **Arches rotated**—After being cast on their sides, two high, the sections had to be rotated to an upright position before being moved to a spot on the hangar floor from which they could be lifted into place. This ticklish operation (arches were not designed for pick-up from a horizontal position) was accomplished with two 23-ton cranes with 80 ft booms, and a 25-ton crane with 60-ft boom.

These cranes were lined up facing the inner curve of the arch section. Hoisting line of the middle crane was attached by a four-way equalizing sling to four points on the inner side. The lines of the other cranes were attached through slings, each to two lifting points on the outer side, opposite the middle crane's lift [illegible]s. After the section had been lifted 45 deg the middle crane slacked off and the outer cranes continued to lift, upward to vertical position. The section then was lowered on a wooden dolly, rolled to location by a lift truck and transferred to horses.

Each section was lifted into place by two cranes. After the erection hinge on the base of the first half had been connected to a similar hinge on the abutment, one crane was released to aid in erection of the other half of the arch. The second half was raised and connected at its abutment, after which the crown ends were jockeyed to position for pin-connection at the third erection hinge.


Erection hinge left in place
2'0"
4 1"ø anchor bolts
Reinforcing bars are welded and gap filled with concrete after all dead load is on arch

FIXED JOINT at abument is achieved by welding bars to projecting reinforcing rods and packing with concrete.

The first arch was braced by temporary timber struts from a box truss over the hangar door line. The second arch was tied to the first with similar struts and by a temporary diagonal-rod lateral bracing system, after which the truss-to-arch struts were removed and the first 24-ft bay loaded progressively upward with 4x24-ft precast concrete panels on each side of the arch.

The panels next to the abutments were laid temporarily on adjacent panels, ready for moving into place after the 30-day lapse of time for foundation settlement. The reinforcing steel projecting at the hinge joints then was welded through continuously to accomplish rigidity. The completed joints were grouted and the remaining panels placed.

Panel joints then were sealed with a vinyl calking compound.

Capt. V. A. A. Powell, District Public Works Officer for the Thirteenth Naval District is officer-in-charge of construction for this project. W. H. Griffiths, Jr., is the resident officer-in-charge of construction. Strand and Sons, Seattle, is the contractor.

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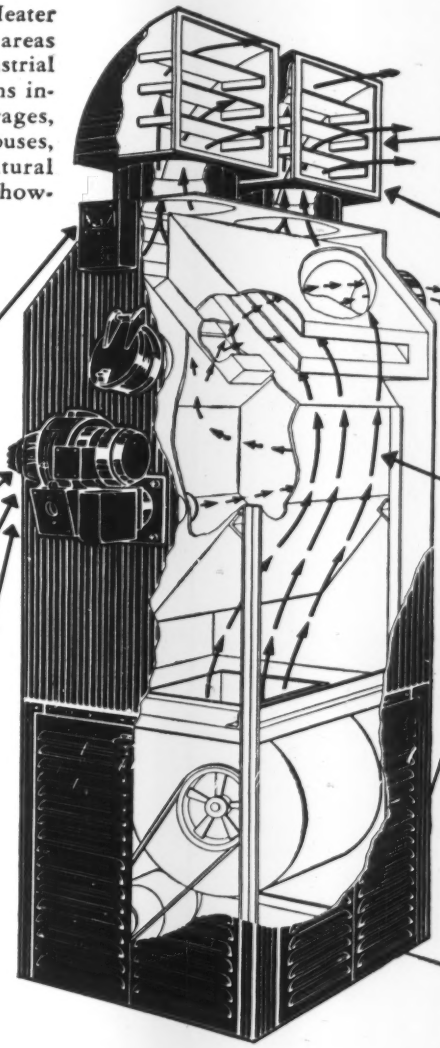

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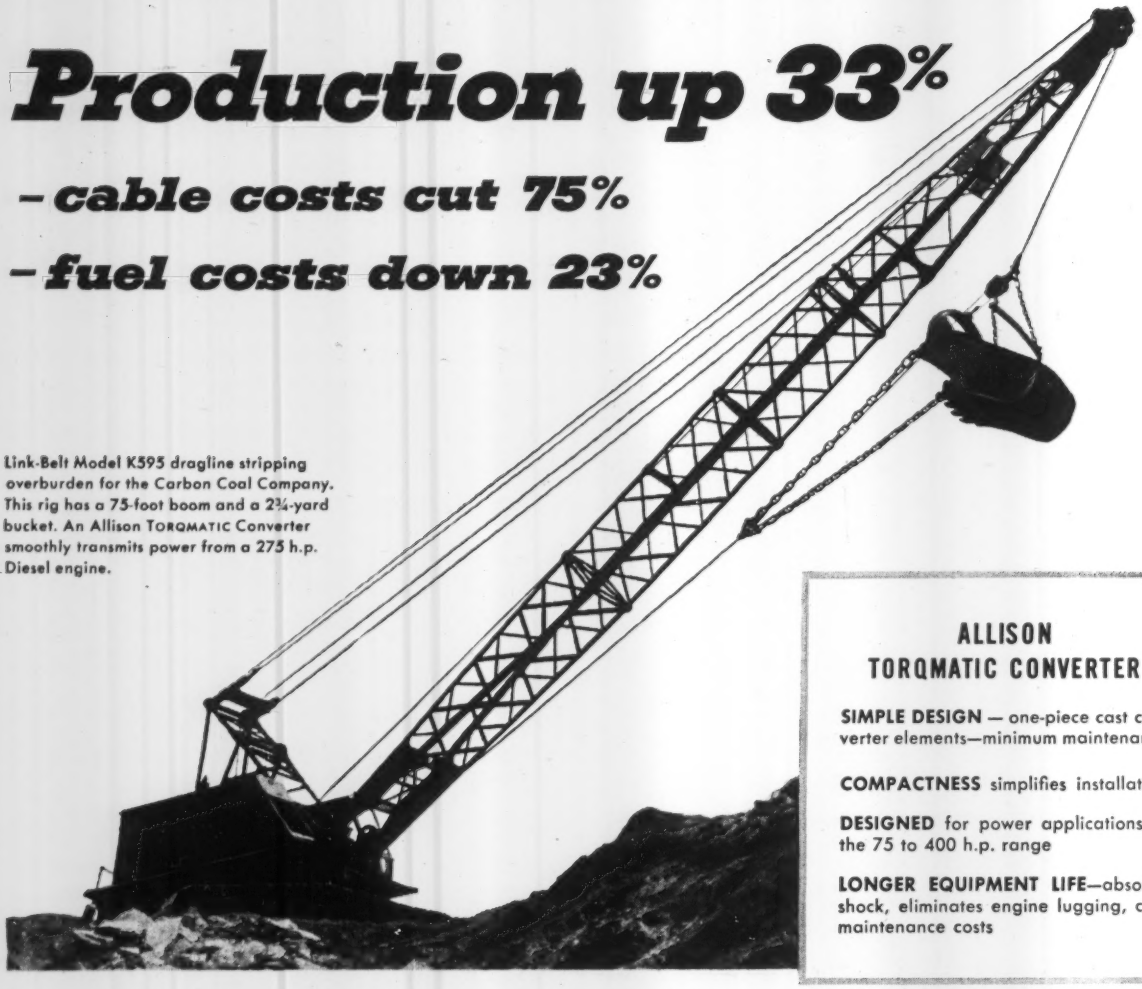

Link-Belt Model K595 dragline stripping overburden for the Carbon Coal Company. This rig has a 75-foot boom and a 2¾-yard bucket. An Allison TORQMATIC Converter smoothly transmits power from a 275 h.p. Diesel engine.

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SIMPLE DESIGN — one-piece cast converter elements—minimum maintenance

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DESIGNED for power applications in the 75 to 400 h.p. range

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The Allison Converter absorbs shock loads so dragline cable on the TORQMATIC-equipped unit lasts four times as long, *saving $2160 a year on cable alone*, a reduction of 75%.

The TORQMATIC-equipped unit strips a 60x40x25 foot "lift" of overburden in 24 hours against 32 hours for the direct-driven unit, a 33% increase in production. A comparison of daily fuel records shows the friction drive unit consumes 130 gallons while the Converter-equipped unit uses only 100 gallons, a cut in fuel costs of 23%.

The TORQMATIC-equipped unit has rolled up such an impressive performance record that this operator intends to specify TORQMATIC DRIVES in all his new heavy-duty equipment. You, too, can cut your costs by specifying Allison TORQMATIC DRIVES the next time you buy. Ask your equipment dealer, manufacturer or write:

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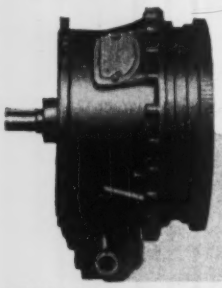

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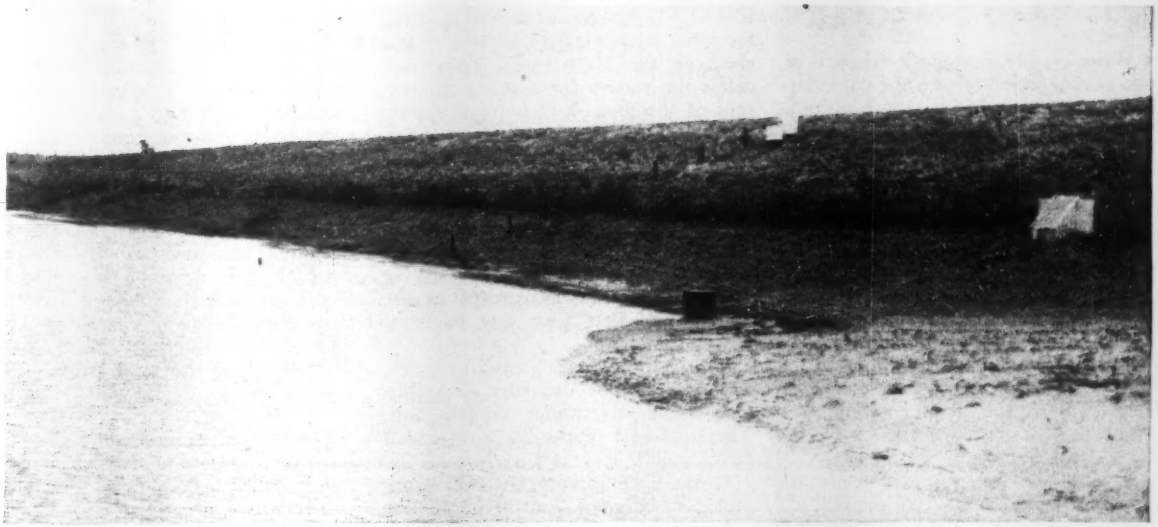


FLOOD DETENTION RESERVOIR on Honey Creek in Texas, one of eight completed to date. The uncontrolled outlet structure (right) is at the level of the top of the sediment reserve pool. At the right center is the corrugated pipe filter that protects the discharge line for that pool, which had been exhausted for stock-watering when this photo was taken.

Starting flood control in minor creek valleys

Ten years ago, the U. S. decided to find out what could be done through upstream conservation. Here's a report on the largest of those river-valley projects

Starting flood control at the headwaters of major rivers on a scale sufficient to demonstrate what can be accomplished in that manner was authorized by the Flood Control Act of 1944. Congress, by that act, gave the Secretary of Agriculture power to undertake coordinated erosion control and stormwater flow retardation on tributary watersheds in eleven river basins, in cooperation with local soil conservation districts.

In those eleven areas, projects "for run-off and water-flow retardation and soil-erosion prevention in aid of flood control" had been authorized under the 1936 Flood Control Act and are superimposed on the nation-wide operations of the Department of Agriculture under the 1935 Soil Conservation Act.

Largest of the river basins selected for improvement is the watershed of the Upper Trinity River in Texas, containing eight million acres of land. Work in that area now has progressed to the point where it is possible to see what has been accomplished and at what cost; also to measure roughly the benefits.

• **A dual program**—This soil and water conservation program is designed to make possible the fullest use of the land within its capabilities. Hence it combines land-treatment measures with construction of structures to retard runoff and minimize flood damage. Land treatment measures include contour plowing, terracing, cover cropping, strip cropping, reseeding of idle or grass lands and proper forestry. Flood-damage prevention includes construction of structures of varying types and size on the flood plains of minor creeks to retard storm runoff and control sediment, also levees to form floodways to protect bottomlands from hillside runoff.

• **Many structures required**—The structures program for the 8,000,000-acre Trinity watershed calls for approximately 546 floodwater retarding reservoirs, 170 miles of floodways, and 325 small sediment-control structures. These are expected to reduce about 58 percent the annual damage due to flood-waters and sediment on the minor watersheds where applied. In addition, it is expected that sedimentation of downstream reservoirs, channels, canals and land-locked coastal waters will be reduced at least 50 percent.

The retarding reservoirs will have a combined capacity of 1,600,000 acre-ft and will retard runoff from some 38 percent of the entire Upper Trinity watershed, or roughly three million acres.

It is estimated that land treatment will reduce the damage from a major storm by two to five percent, and damages from minor storms as much as 40 percent. It will cut minor watershed annual flood-water and sediment damages by an estimated 16 percent.

• **Local cooperation required**—This program is being carried out by the Soil Conservation Service of the U. S. Department of Agriculture in cooperation with sixteen local soil conservation districts, which are landowner-controlled, state agencies set up for this purpose. The Trinity Improvement Association is a principal sponsoring agency. It is a non-profit corporation which has represented the local interests for 23 years.

Costs are shared approximately on this basis: Federal, 50 percent; non-federal (local) public agencies, 10 percent; cooperating landowners, 40 percent.

For administrative purposes the Trinity River watershed is subdivided into the valleys of principal tributary streams and, further, into the watersheds of minor creeks. To date, preliminary plans have been made for 29 of these creek watersheds, covering 4,686,000 acres of the 8,000,000 in the entire basin. Included are four fairly large creek watersheds, and a lateral system of short "hillside streams" directly affecting main-stem levee systems, in which 43 small detention reservoirs have been built at a cost of $1,687,000. These flood retarding structures are expected to reduce to less-than-channel capacity the

runoff from 79,170 acres in floods of the 25-100-year magnitude.

• **Work on the East Fork**—Typical of the work done on these principal tributary streams is what has been accomplished on the East Fork of the Trinity, which is classified as a bad actor having a record of more than one hundred floods during a recent 20-year period.

That stream also is the site for Lavon reservoir, one of the major flood control-conservation reservoirs being built by the Corps of Engineers for the Trinity River basin.

Of the 840,000 acres in this watershed, 67,500 acres are floodplain lands that lie above the Lavon reservoir and along the tributaries of the East Fork below the reservoir.

It is good land, some of the most productive in Texas. The main trouble is that the farmers cannot depend on making a crop. During a recent 20-year period there were 110 flash floods on the East Fork, causing damage estimated at $1,874,000 annually.

To minimize flood damage, a system of 107 floodwater retarding structures has been planned for the watershed of the East Fork. They will catch the runoff from about 56 percent of the area, discharging it slowly through automatic drawdown tubes.

Most of these reservoirs will have sediment reserve pools in addition to their flood storage capacity. These pools occupy only four percent of the good bottomland. Some reservoirs are retarding structures only, having no permanent storage except in the borrow pits that were dug to build the dams.

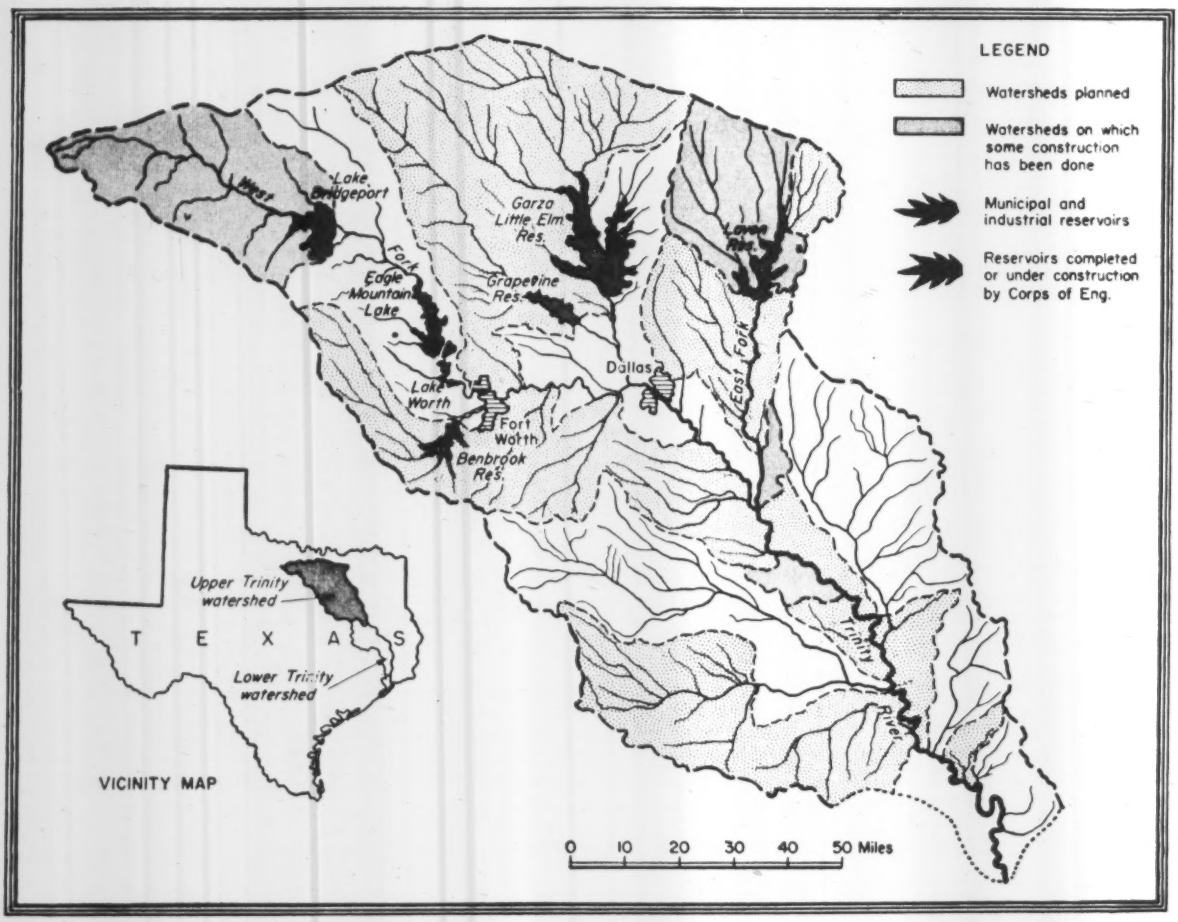
Thirteen of these East Fork reservoirs have been completed and thirteen more are under construction. The total cost of the 26 is estimated at $900,000.

Other East Fork construction work includes sediment control and gully-stabilization structures of the drop-inlet or the weir-and-apron type, and flood-water diversion levees and floodways. The cost of all structures is estimated to be $9.84 million, which includes an estimate of $1.6 million for value of easements to be furnished by local interests.

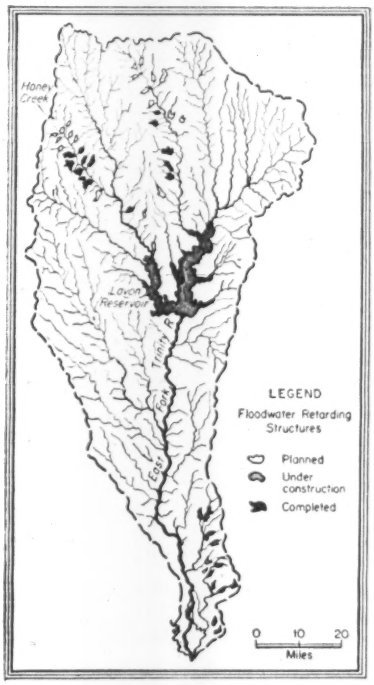
Land treatment measures, in addition to gully-stabilization structures, include seeding of idle and eroded cropland, terracing, construction of vegetated waterways, farm ponds, crop rotation and proper pasture management. This work will cost approximately $13.3 million, which will be shared by the USDA and the cooperating land owners.

Local soil conservation districts now have more than 900 conservation farm plans "working", covering 150,000 acres of the East Fork. About 25 percent of the land treatment is now in effect.

• **Flood storage reservoirs**—A typical floodwater retarding structure—commonly called a flood-prevention reservoir—consists of a rolled-fill dam with an uncontrolled outlet culvert discharging under the dam to the creek channel below. The outlet is of drop type, being a box-like vertical concrete shaft in the upstream toe of the dam, feeding the 12- or 18-in. concrete out-



TRIBUTARY STREAMS in the watershed of the Upper Trinity River in Texas on which some flood-flow retardation work has been started are shown shaded on this map.



EAST FORK WATERSHED of Trinity River valley. Detention reservoirs completed are shown solid black; those under construction are shaded, and ones for which plans have been made are shown in outline only. Eventually, 107 of these detention reservoirs are to be built.

let pipe. The top of this shaft is at the level of the sediment reserve pool and has a debris guard, now usually of metal although timber was used.

Provision also is made for draining the sediment pool by installing a 6- to 8-in. metal pipe from the bottom of the outlet shaft to a "filter" in the bottom of that pool. This filter consists of a short piece of perforated corrugated culvert pipe, set vertically, with a plate top. The valve to control this drain is located in the outlet shaft.

To prevent overtopping of the dam in an abnormal flood, a sodded emergency spillway is provided overland around one end, sometimes both ends, of the dam.

The larger reservoirs are designed to handle the runoff from a rainfall of 100-yr. frequency with not over a 24-in. depth of water in the emergency spillway. These spillway channels are cut through undisturbed formations, which in the Trinity valley often contain soft limestone ledges.

Sediment control structures are similar to the larger reservoirs in design, but are much smaller. They usually have a detention capacity for a runoff up to that from a 2-in. rainfall. However, their automatic outlets have a larger discharge capacity in relation to drainage area than for the larger reservoirs. A typical structure might discharge two-thirds of the runoff through its drop-type outlet structure and one-third through the spillway channel.

• **Reduction in flood damage**—Land treatment is expected to reduce East Fork flood damage by about 28 percent, and the floodwater retardation structures will cut off an additional 64 percent, or approximately 90 percent in all. This, of course, only on the small creeks so improved.

In addition to this estimated reduction of $1.7 million in the present annual damage bill, the landowners are expected to gain $697,000 in annual income through more intensive use of the flood plains of the improved small creeks. Also, the upland farmers are expected to add about $6 million to their net income as a result of their land treatment measures, or a total gain of $8,378,000.

Total cost of the work to produce this annual saving is put at $23,088,000, of which the federal government will bear approximately 60 percent.

On the East Fork, the federal share of flood prevention is somewhat larger than on the remainder of the Trinity, because of certain physical features and conditions and the fact that many levees, built without federal assistance, need protection against hillside water.

According to the last Presidential budget, local interests had spent $7,453,000 through fiscal year 1953 for floodwater retarding structures and practices and in the whole watershed of the upper Trinity River. It is estimated that their total expenditures will aggregate $52,500,000 to complete the present program. The Budget Bureau reported also that the Soil Conservation Service had spent $7,150,000 on similar work and estimated that $57,800,000 more will be needed. In addition, about $10,000,000 has been spent on the Trinity watershed under the 1935 Soil Conservation Law, about equally divided between federal and local interests. No estimates are available as to the total that will be required.

Information on which this account is based was supplied by Forrest L. Park, engineer for the Trinity Improvement Association, for which organization the engineering firm of Freese & Nichols, Fort Worth, are consultants. Engineering for the Soil Conservation Service is under the direction of Howard Matson, acting assistant regional director-engineering.

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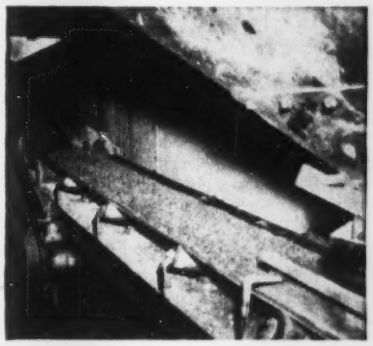

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Arverne Houses, Long Island, New York. Tuck & Eipel, New York City, Consulting Engineers. Gull Contracting Company, Brooklyn, New York, General Contractor. Photo by Fairchild Aerial Surveys, Inc., Long Island, New York.

THE seven apartment buildings that make up Arverne Houses, a New York City housing project, are resting on Koppers Pressure-Creosoted Foundation Piles. Koppers Piles are specified for many such projects where strength, permanence and low cost are important factors.

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DAM AS IT LOOKED during engineer inspection 25 years after abandonment.

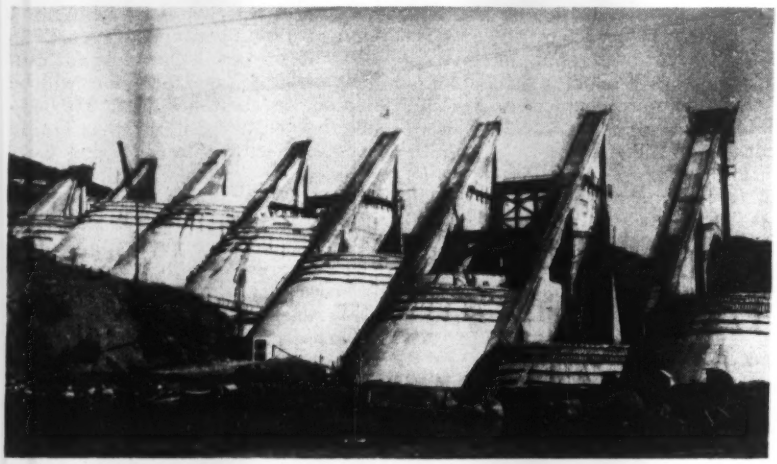
Sutherland Dam nears completion after 25-year construction lapse

In 1928, lack of funds and a dispute over the raparian rights of land owners below the site wrote "finis" to the efforts of the San Diego City Water Department to complete a 1,240-ft buttress-and-arch dam on Santa Ysabel Creek east of the city.

The Sutherland Dam, started in 1927 and 25% complete when work stopped, lay abandoned until July, 1952, when activity on the 17-arch structure was resumed under a new set of contracts financed by a $6.5-million municipal bond issue. It is now nearing completion.

• **Structure unchanged**—Contractors found that all the old work was usable with concrete in good condition and most of the projecting steel requiring only sand blasting to remove the rust. In some cases new steel had to be doweled into the old concrete at places where vandals had sawed through and removed the original reinforcing.

Very little design change was made on the original plans. Only the struts between the buttresses were revamped for earthquake protection. In the original design the struts were continu-



ARCHES RISE during renewed activity on the 1,240-ft structure.

ous all the way through from buttress to buttress, but on account of possible destructive vibrations during a 'quake because of lateral stiffness some of the struts were blasted out, leaving the buttresses tied together in blocks of three and four.

• **Dispute resumption blocked**—One of the first steps under the present plan was to purchase at a cost of almost $1 million a huge tract of farm land below the damsite. This was the tract that brought about the water rights dispute and the decision to abandon the work in 1928.

• **Details**—Buttresses—on 60-ft centers—range from 10 ft in thickness at the base to 3 ft, 4 in. at the top. The arches are six ft at the base, and two ft thick at the crest which is 161 ft above the streambed. Foundations range from five to 60 ft extended to solid rock.

Storage will be 29,000 acre-ft, and with installation of spillway gates (not at present contemplated) the capacity would be 36,700 acre-ft. The city expects to obtain a net safe yield of eight mgd from the reservoir. Completion of the project, originally slated for next month, is now scheduled for March, 1954. Blame for the delay has been placed upon excavation that took longer than was anticipated.

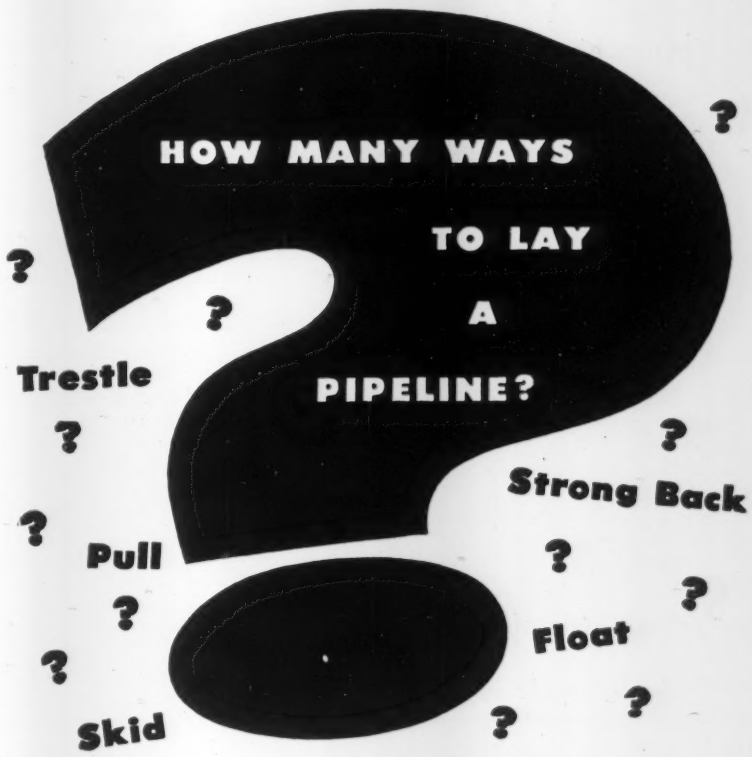
• **Pipeline progresses**—The dam will empty its water supply into the city's San Vicente Reservoir as needed, and for this purpose a 60,000-ft pipeline is being constructed involving a 3,000-ft, 6-ft diameter tunnel in Black Canyon. The tunnel, section II of the project, was holed through on Oct. 3.

The dam was designed originally by Walter F. Cowles and Arthur P. Davis of the San Diego City Water Department. The original work was placed by Edwards, Wildey and Dixon, of Los Angeles—now the L. E. Dixon Construction Co. Paul Beerman, now director of the department, spearheaded the movement for resumption of the work on the project.

The present dam contract is a joint venture, with Bent Construction Co., Alhambra, and Daley Corp., San Diego, handling the work. The pipe contracts were let in three sections with the Shea Co., Alhambra; Engineering Constructors of South Gate, Calif., and Harry L. Foster, San Diego sharing honors.

The work was directed by Stanley Bent II until his death in an airplane crash early this year. Since that time George Daley has been in charge.

(*Municipal continued on page 50*)



Actually there are more ways than you can shake a stick at . . . depending on the site conditions, and the versatility, ingenuity and experience of the construction company assigned.

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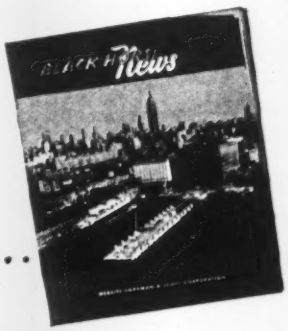

Space doesn't permit the telling of these interesting stories, but full accounts of most of them are contained in recent issues of our quarterly house organ, The Black Horse News. For reprints of the pipe line stories write Dept. N. We will also place your name on the mailing list to receive future issues of the Black Horse News.

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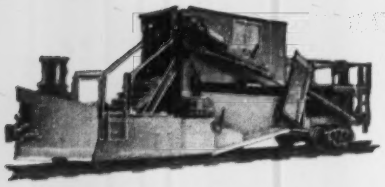

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Bond vote clears the way for St. Louis plaza and housing

When St. Louis voters recently stamped their approval on issuance of municipal bonds to the amount of $1.5 million to finance development of a plaza park near the city's Union Station, it was the green light for the eventual construction nearby of seven 12-story apartment buildings with a total of 1,350 family units.

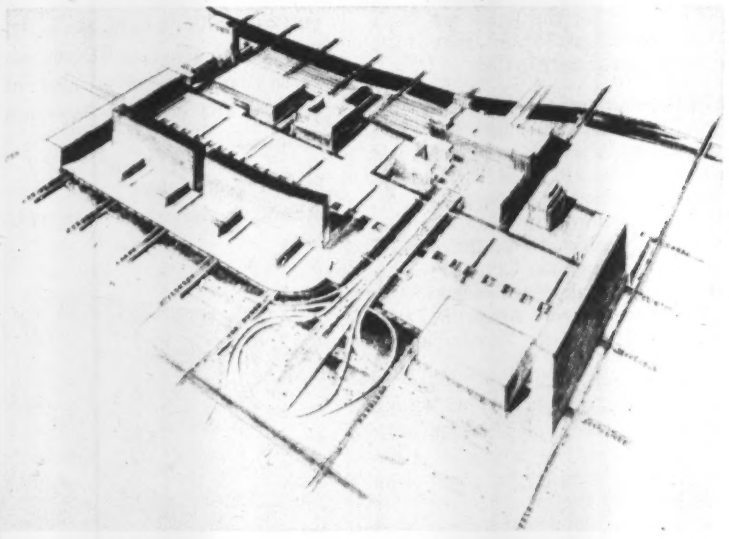
Passage of the bond issue, which failed at an earlier election last March, authorized the city to go ahead with plans for purchasing and leveling three blocks of old, mostly dilapidated buildings to create a park linking the Aloe and Memorial plazas. Bonds will be issued for that purpose.

Under an arrangement already tentatively approved by the HHFA, the city will borrow about $2.5 million from the federal agency to finance buying and clearing an additional five and one-half blocks adjacent to the new plaza. At that point, private enterprise will take over.

The cleared land will be sold to the highest bidder—presumably the Urban Redevelopment Corp. of St. Louis, organized by 68 firms which wanted to pump new life into the city's decayed areas. The group has raised $2 million and will borrow another $18 million of private capital to finance the proposed $20-million apartment project.

Former St. Louis Mayor Aloys P. Kaufmann, executive vice-president of the URC, has emphasized that the apartments will be designed for occupancy by middle-income tenants. It has been estimated that the entire redevelopment project will provide approximately 4 million man-hours of work.

• **Federal aid in write-down recovery**



A PROPOSED CIVIC CENTER, now being studied by Chicago's City Council, would occupy a site on the west bank of the Chicago River. The site, about one mile long and one-half mile wide, spans the Congress St. superhighway and borders on a cloverleaf interchange where three expressways will converge. The buildings would accommodate city, county, state and federal offices as well as the Sanitary District Board, the Park District, Board of Education, court and other public agencies. Proposed for immediate construction is a 10-story, 450,000-sq ft building to house Chicago's traffic court and other agencies that are in critical need of space. Estimated cost of the structure is placed at about $8 million. Developed in stages over a period of years, the completed project would contain parking facilities for thousands of cars, an exhibition building, and extensive office facilities.

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● In the past, directional changes in the tubes used in fuel economizers for boilers have been made with flanged U-bends or with header boxes. Although leakage was inevitable sooner or later, and repairs difficult, such conventional connections were necessary to permit periodic dismantling and mechanical cleaning.

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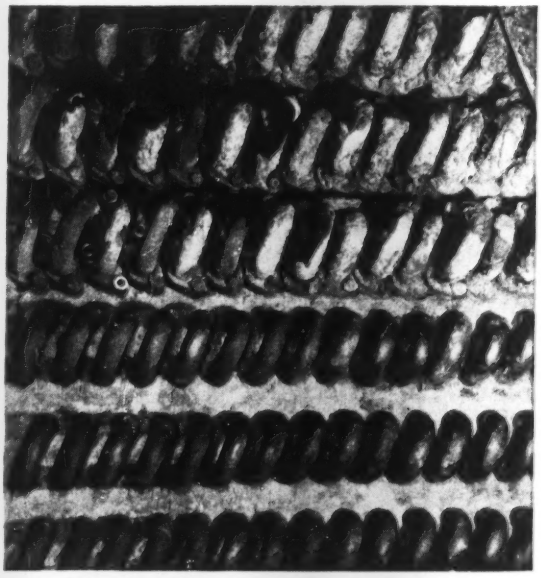
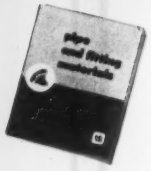


At top: flanged connections in economizer. *At bottom:* permanently leakproof, TUBE-TURN Welding Returns.

Shop fabrication of welded piping assemblies is easy, thanks to the uniform wall thickness and dimensional accuracy of TUBE-TURN Welding Fittings. Line-up is fast and accurate.



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—Resale value of the cleared land, when the city turns it over to the private agency, is expected to be about $1.25 million. Under the terms of slum clearance and urban rehabilitation provisions of the Federal Housing Act of 1949, the government will pay two thirds of write-down and the city the remaining third.

The law provides, however, that the municipal contribution need not be in cash, but may take the form of a park, school or other improvement. In this instance, federal officials have agreed that the new plaza will be acceptable as the city's share.

Civic leaders, churchmen, business executives and newspapers took part in an intensive campaign to obtain passage of the bond issue, representing the election as the turning point—forward or backward—in the city's progress. Edwin M. Clark, president of Southwestern Bell Telephone Co., headed a citizens' committee which directed the campaign.

City performs annual audit stressing master plan need

Toledo, Ohio, officials, having completed the eighth annual audit of the city's progress in development according to a master plan, claim that many of the improvements suggested in a "Toledo Tomorrow" exhibit of 1945, are now in concrete form.

The exhibit stressed that razing and rebuilding of a city in revolutionary fashion is not the way to achieve the goal of better housing, less congestion in streets and safer, saner living. The same results can be achieved through evolutionary rebuilding that takes place over a period of 30 years under the guidance of a master plan and through progressive thinking.

• Here's what the audit shows:

• Construction progresses on the Oak Openings Airport, a $3.5-million project undertaken to be entirely financed with municipal revenues.

• Foundation work on the new North End Bridge is nearing completion.

• Contracts soon to be let for a multi-million dollar paving job for an expressway to the Michigan-Ohio line.

• Improvement of 113 streets and alleys with adequate lighting installed.

• A start on the $7.5-million expansion of the water treatment and distribution system.

• A $10-million sewage disposal project in the planning stage and firmly assured.

• Six new churches completed or under construction.

• Recently dedicated Jewish Community Center and St. George's Greek Orthodox educational buildings.

• Millions of dollars in school and hospital construction.

• Industrial expansion—the greatest of which is the $29-million Bay Front Electric generating station under construction by the Toledo Edison Co. to help meet the demands of the Toledo of tomorrow.

One improvement now being proposed is a dream highway envisioned in "Toledo Tomorrow," and considered a necessary addition to the city network to speed traffic between downtown and West Toledo.

Attack slum source

Resolution hits renting of rooms—not apartments

A resolution appointing a committee of the city council to investigate the activities of real estate speculators whose practices create slum conditions in the city has been offered by New York City Council vice-chairman Joseph T. Sharkey. Municipal observers see the move as a step toward attacking the slum problem at its source.

According to the resolution, there is a widespread practice of real estate speculators to acquire residential buildings at a greater than fair market value, for the purpose of reselling the property with the "tacit understanding that illegal occupancy and illegal rentals would pay the installments demanded on outrageous mortgages to cover the exorbitant reselling prices." The civil leader sees the practice as endangering health as well as property valuations.

The operators buy a building at a price somewhere near its assessed valuation—only to resell it a few days later to a person who is in dire need of residential space—either upon an installment sales contract or low down payment—with mortgages two, three, or four in number, totaling frequently two or three times the assessed valuation or the original purchase price that the operator or speculator had paid for the building.

• Room rent instead of apartment rent—The speculators, however, induce buyers without means to purchase these buildings on the basis that they may collect room rent instead of apartment rent, and thus be able to make installment payments on mortgages which generally are several times the total monthly legal rental.

If the practice is not stopped by

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Projector dimensions — 14½" wide — 11½" deep — 26" high	
Dia. of Reflector	14"
Center of Refl. above ground—short stand	18"
Center of Refl. above ground—tripod stand	8' max. 5' min.
Weight of Projector without oil	22 lbs.
Weight of Projector with oil	28 lbs.
Weight of short stand	5 lbs.
Weight of tripod stand	34 lbs.
Capacity (sufficient for about 40 burning hours)	6 pts.

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Excellent for use in confined spaces as a hand inspection lamp or as a small floodlight. Overall dimensions 9x9x 11-½"—weight 7-½ lbs.—dia. of Refl. 7"—oil capacity 1-½ pints—will burn 12 hours and gives a 2000 C.P. reflected light.

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appropriate legislation, says Sharkey, the evil will grow and cause enormous destruction to entire communities within Greater New York.

- **Here is the pattern:**
- A purchaser is advised to offer rooms for rent within an apartment rather than to rent the apartment.
- If the building is a two-family building where the rental scale would be approximately $45 per apartment, or $90 per month, the purchaser is advised to occupy one or two rooms himself, and to rent the six remaining rooms to as many persons, couples or families at approximately $15 per room per week.
- The purchaser is then advised that the rent revenue would be $90 per week rather than $90 per month, thereby enabling him to pay between $200 and $250 per month on an installment sales contract.
- When the speculator within 12 to 18 months has received back substantially all of his investment through the payments on the installment purchase contract, he then transfers the deed over to the purchaser. This deed is burdened with a first mortgage (which the speculator keeps, and which is his profit generally $3,000 to $5,000) and then discounts at between 40% and 60% the 2nd, 3rd and 4th mortgages which were executed to cover the balance of the purchase price.

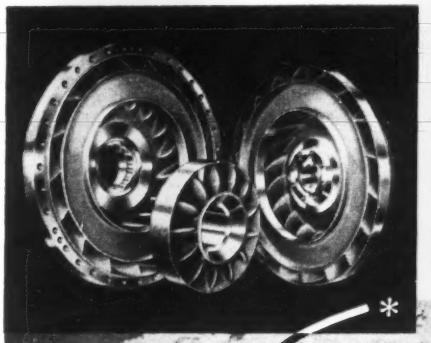
Dedicate Penn-Lincoln West

The official opening of the Penn-Lincoln Parkway West last month was a final step in speeding road communications in the area of the Greater Pittsburgh Airport.

Hooking up with the already-completed, five-mile Airport Parkway, the highway will cut about a half-hour off the present traveling time, making it the shortest airport run of any major American city it is claimed.

The dedication was sponsored by civic leaders in the communities touched by the Parkway—Greentree, Scott Township, Carnegie, Rosslyn Farms, Collier Twp., North Fayette Twp., Robinson Twp. and Moon Twp.

This nine-mile western leg of the 28-mile expressway, built at a cost of about $15 million, is only one link of a $100-million "magic carpet." The only section uncertain of early completion is the one-mile link between east and west legs involving the construction of a $16-million tunnel under Duquesne Heights (ENR, June 25, p. 49), cutting through Mount



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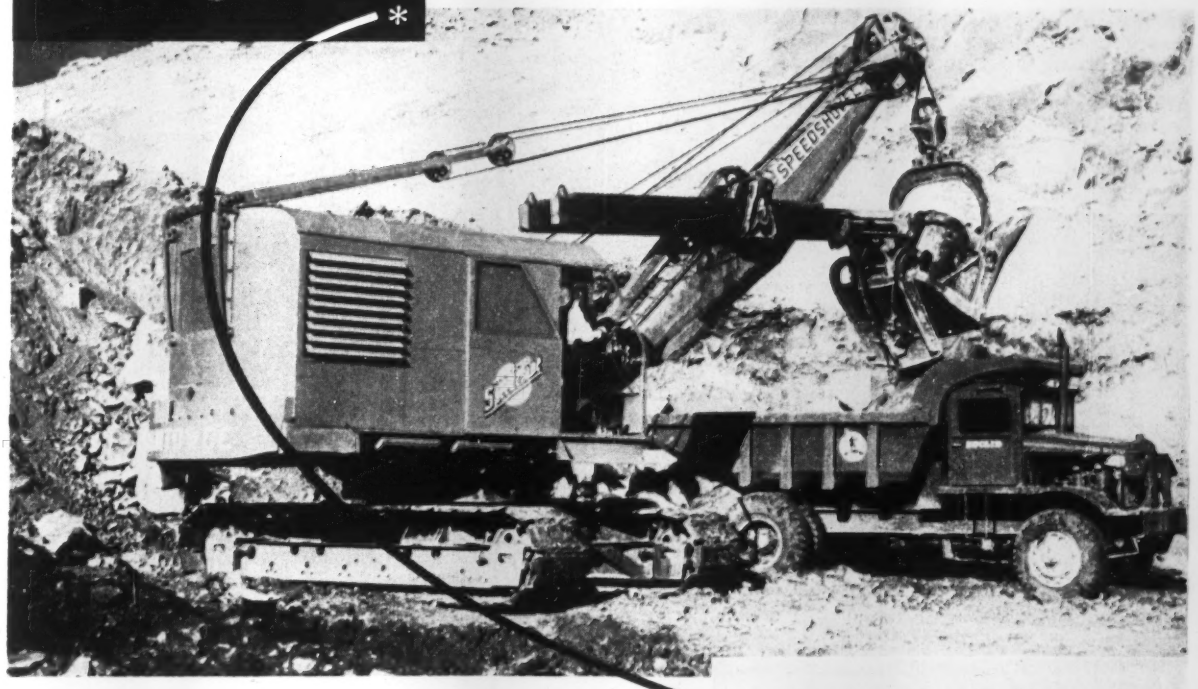

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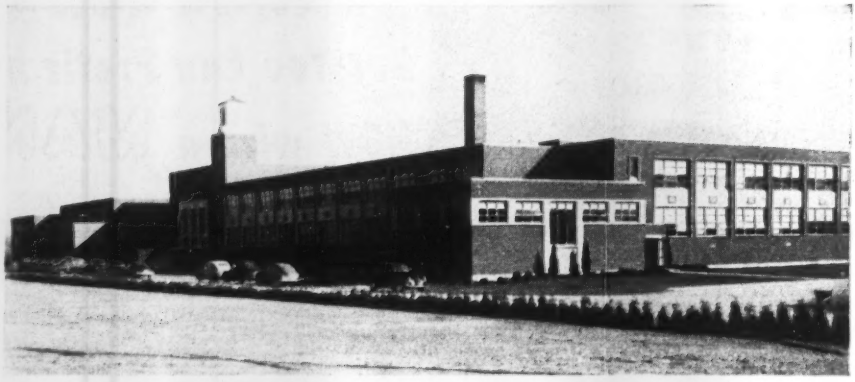
Three Interesting New Buildings

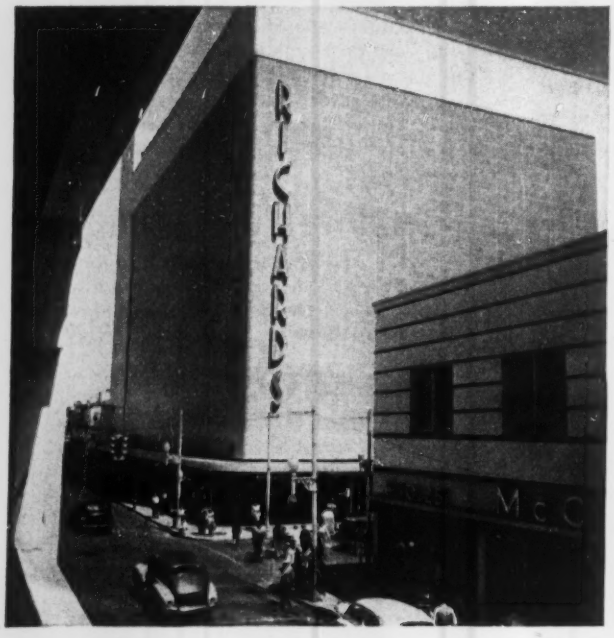
HIGH SCHOOL

Typical of the modern trend in buildings for educational purposes is the recently completed Clarence Central Junior-Senior High School, Clarence, N. Y. The two-story brick structure has complete facilities for 700 students. Its steel framework is made up of nearly 450 tons of Bethlehem Structural Shapes. *Architect:* Paul H. Harbach; *General Contractor:* The W. F. Hendrich Co., Inc.; *Structural Engineer:* T. H. McKaig; *Steel Fabricator and Erector:* Ernst Construction Corp.—all of Buffalo.



TANK PLANT

This attractive manufacturing building is the new Budd tank plant, located in Philadelphia. Its facing of red brick covers a 3000-ton steel framework built of Bethlehem Structural Shapes. *Architects and Engineers:* Giffels & Vallet, Inc., L. Rossetti, Detroit; *Steel Fabricator and Erector:* Belmont Iron Works, Philadelphia.



DEPARTMENT STORE

This striking and original structure is the Richards Department Store, one of the favorite shopping places in Miami. Some 500 tons of Bethlehem Structural Shapes were used in building its steel framework. *Architects:* Steward & Skinner; *Structural Engineers:* Jorgensen & Schreffler; *General Contractor:* Fred Howland, Inc.; *Steel Fabricator and Erector:* Bushnell Steel Products, Inc.—all of Miami.

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BETHLEHEM STEEL

Washington at a point 1,500 ft above the existing Point Bridge.

A new bridge also is planned in this link, and until these structures are completed, traffic will swing around the mountain on the million-dollar West End Bypass.

The Duquesne Heights Tunnel, shorter than the Squirrel Hill Tunnel now serving Penn-Lincoln Parkway East, will have twin tubes carrying 12-ft traffic lanes. The tubes will be about 3,600 ft long.

New barge terminals urged

The need for dock space to handle millions of tons of material annually has dictated planning of new inland waterway facilities in two Midwest communities.

With plans for a multi-million-dollar project, the port of Ashtabula, Ohio, is making its bid to become one of the busiest shipping centers on the Great Lakes. The plans, involving terminal facilities for self-unloading lake and ocean-going ships, were explained recently to Army engineers in the city.

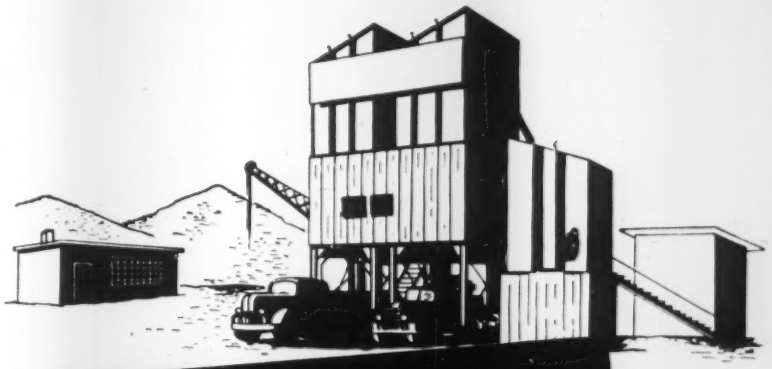
N. J. Pinney, president of the Pinney Dock & Transport Co., has been building docks to provide two slips off old Woodland Beach Park. Under construction for 18 months, the docks will have slips 150 ft wide and 2,000 ft long. Facing on these structures will be principally of concrete and steel.

While the planned docks will be used by self-unloading vessels at first, Pinney said he envisaged construction of warehouses and other unloading facilities in the future.

Army engineers will be asked to deepen the outer harbor to a depth of 25 ft with a channel of sufficient width to accommodate all types of ships. Pinney adds, however, that his company will dredge its own slips and adjacent water areas.

• **Mississippi coal dock**—At East Winona, Wis., the Sterling-Midland Coal Co. plans construction of a barge-rail terminal dock at an estimated cost of about $500,000. Spokesman Edward A. Glaeser, said the company intends to complete the first 50-acre section of the dock some time next year. He claims that the expanded terminal will be capable of handling a millions tons of coal and other commodities annually.

The terminal will permit midwestern coal to reach Wisconsin markets at lower cost because of reduced transportation rates. At present all coal is shipped by rail from midwestern mines.



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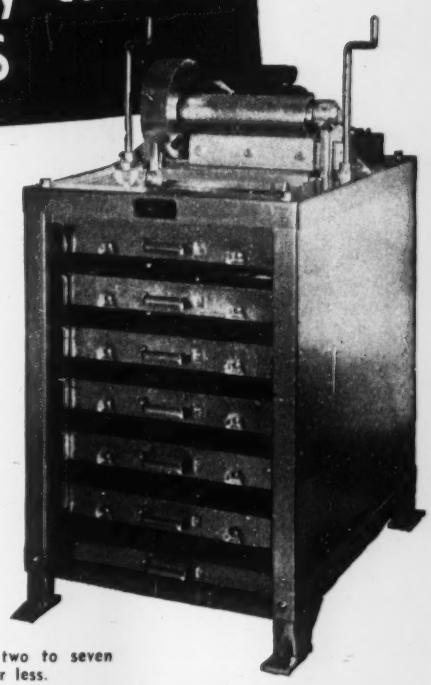

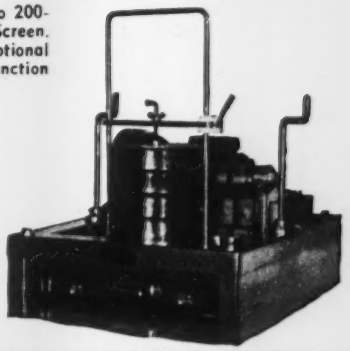

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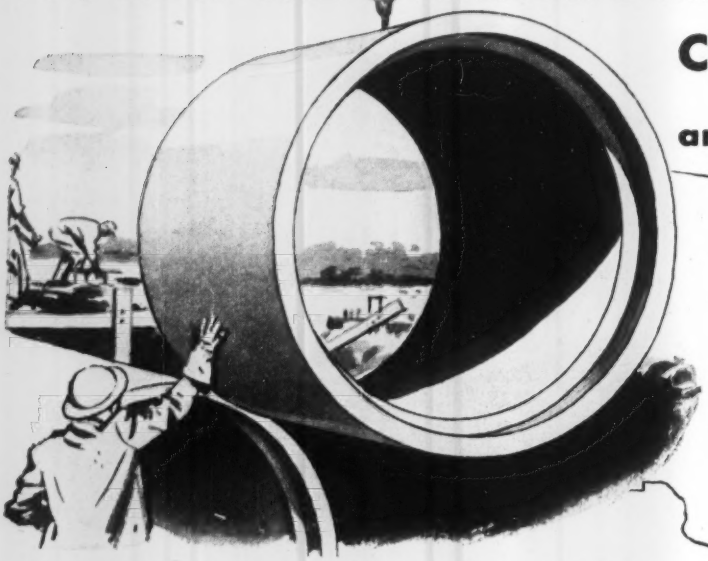

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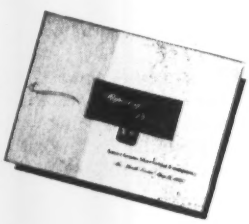
American-Marietta's dynamic growth record is a story of planned expansion in diversified, basic industries. A copy of our 1953 Semi-annual Report of Progress will be sent upon request. Address: Dept. CP.



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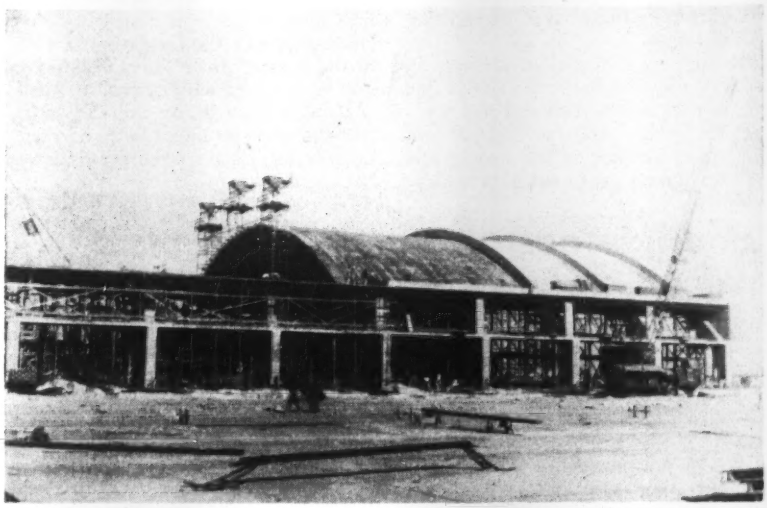
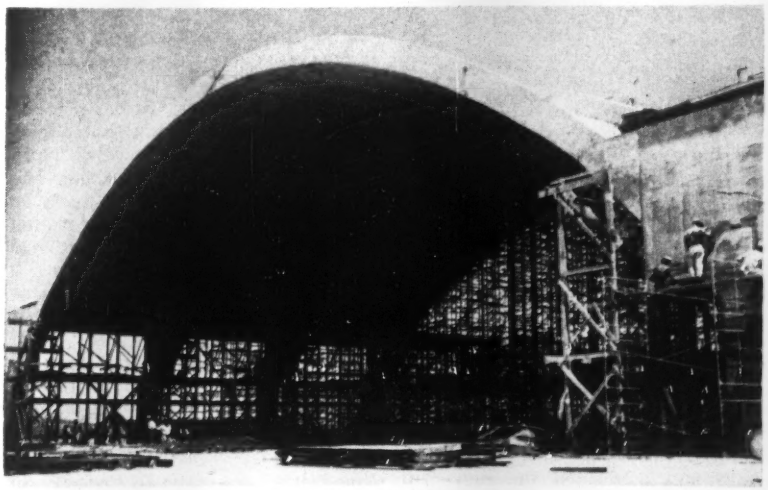


CONCRETE HANGAR ROOF, at Guantanamo Bay, Cuba, spans 150 ft, and the full 240-ft length of the roof was made in four 60-ft wide pours.



WITH THE FIRST 60-FT ROOF POUR FINISHED, formwork on tubular steel scaffolding has been drawn forward on skids and is ready for the next pour.

Arched hangar roof, spanning 150 ft, is a 4-in. shell between arch ribs

A reinforced concrete hangar, nearing completion at Guatanamo Bay, Cuba, (ENR July 30, 1953 p. 50) will have a clear floor 240 ft long by 150 ft wide, covered by a 4-in. thick thin-shell roof supported by arch ribs on 30-ft centers. The thin-shell thickens to 5 in. at the arch ribs. The roof provides a clear height of 52 ft at mid-floor.

Reinforced concrete lean-to's will provide two-story office and shop space on either side of the hangar. One lean-to will be 100 ft wide and on the other 60 ft wide.

• **Big ribs**—Springing from 18-ft high columns, the arch ribs themselves span 168 ft 6 in., and they are 16 in. wide with a depth of 3 ft 3 in. at the crown and 4 ft 2 in. deep at the spring line. Every other arch rib incorporates an expansion joint.

Thrust of the arch ribs, carried down through the supporting concrete columns, is taken by cantilever

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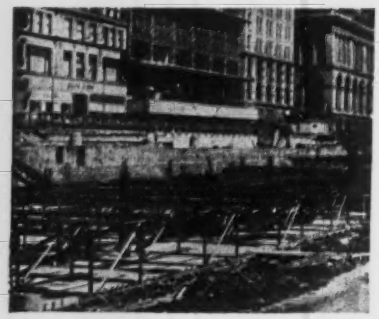

Elis Adjustable Shores Are Shown in Use on the Big Subsurface Parking Development Under Michigan Avenue

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thrust footings. These footings are 6 ft wide and 6 ft deep and extend 37 ft outward from the supporting column bases.

Eight steel sliding door sections 35 ft high will enclose both ends of the 150-ft wide hangar. When the doors are to be opened, four leaves will slide to either side of the hangar and will be housed in special structures at the ends of the concrete lean-to on either side of the hangar. This housing allows a door opening across the entire width of the hangar. The ends of the hangar above the sliding doors will be enclosed with corrugated steel.

Roberts & Schaefer are the architect-engineers on the project and Frederick Snare Corp. is the general contractor, both firms of New York.

Landslide destruction of power plant blamed on leaks in penstock tunnel

Leakage through rock fissures in pen stocks driven through a mountain above the plant is now unofficially blamed for a landslide that severely damaged the Whatshan power plant and transformer station last August. Cause of the disaster to the plant—at lower Arrow Lake near Needles, B. C., has been subject of a series of engineering studies that have not yet been made public.

Situated at the foot of the heavily wooded mountain on the edge of the lake, the $6-million, 25,000-kw installation was completed in 1951. Water came down through two 2 mi long, 12-ft dia tunnels dropping about 700 ft from the Whatshan reservoir. Only the lower and upper ends of the two tunnels were lined with concrete. The rest of their length was left unlined through the mountain rock formations. The installation was designed by the British Columbia Power Commission.

BCPC Chairman S. R. Weston, recently testified before the Royal Investigation Commission in Vancouver that cracks in the concrete walls of the lower sections of the tunnels let out water which seeped through rock faults and permeated the mountain side until the weight of the soil was sufficient to start a slide. During construction the BCPC had sent the General Construction Co., Vancouver, to investigate the tunnel work, and the report (read at the inquiry) that GC made implied poor control and quality of concrete at the time the tunnels were lined. GC's report also pointed out that examination of tunnel rock had shown seams of material which would decompose on contact with air and water. The report had recommended lining the complete length of the tunnels with concrete.

• **Knowledge of slides**—The BCPC was aware that slides could occur in the area and a small flume had been built above the power house to keep debris from the mountainside from doing any damage. On Aug. 11, five days before the landslide, a minor mud slide had occured near the power plant. BCPC's chief engineer, A. W. Lash, did not suspect that there was anything wrong with the tunnel at that time, he told the inquiry group. The chief engineer also believed that a second slide could not have been prevented by draining the tunnel after the first slide.

BCPC's chairman told the inquiry body that it was impossible to prevent leakage from the tunnel completely, but that the tunnel was being strengthened and that BCPC planned to remove all talus and earth and level off the land above the power plant to prevent a recurrence of a slide like that of Aug. 11.

When the hydro project got started in 1946, the BCPC admitted it had never seriously considered having a geological survey of the area made before calling for bids. However, the H. G. Acres Co., Niagara Falls., Ont., which carried out the initial plans for the project, and is now conducting investigation on the site, in 1946 recommended that drilling be undertaken to determine the existence of faults and fissures in the rock.

BCPC's chief engineer said that if he had had the benefit of present knowledge he would have built the tunnel in much the same way, but would have lined it more extensively with steel or concrete to prevent leakage. He said he had rejected a plan submitted earlier that called for penstocks exposed on the mountain side for the last part of the two-mile tunnels. This plan, he had thought at the time, would have proved too expensive.

It has not yet been determined how much damage was done to the turbines buried under the slide, but authoritative opinions are that rehabilitation of the power plant will easily cost "hundreds of thousands of dollars."

(*International continued on page 63*)

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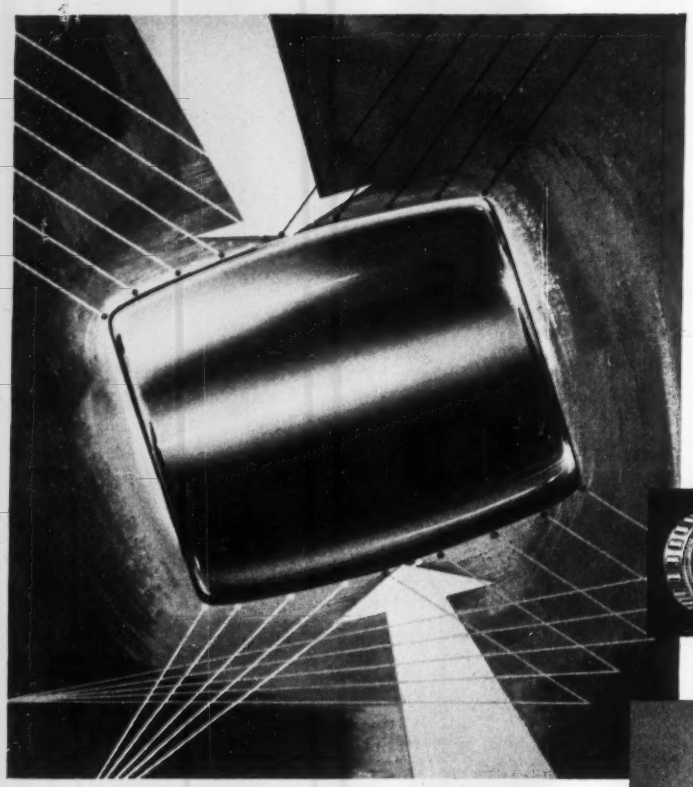

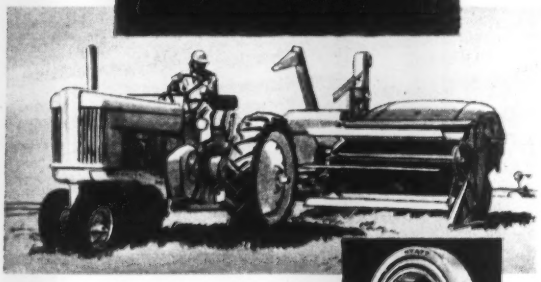

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International briefs . . .

• **Cement mills for Turkey**—Expansion plans in Turkey now include the construction of 38 cement plants at a cost of $18 million. The government is advertising for bids on 15 of the plants.

• **Canadian pipeline**—Socony-Vacuum Oil Co., Ltd., Regina, Sask., plans to construct a 175-mile pipeline from Fosterton to Regina at a cost of more than $40 million.

• **Istanbul subway**—The Turkish Minister of Works has announced that the government has a firm intention of building a subway in Istanbul. It would be constructed on plans submitted by Dutch and French experts.

• **Canadian lift slab**—The trend to lift-slabs has moved into Canada (see p. 25): a 3-story building in Regina, Sask., this month, will have its roof, first, and second floors lifted by hydraulic jacks from the street level. The slabs are each 58x78 ft and 9 in thick. Twelve hydraulic jacks acting through lifting collars in each slab will do the raising job. Smith Bothers and Wilson, Regina, are contractors.

• **Asian road plans**—Malaya has announced a 10-year road and bridge building program to cost $57 million, of which $43 million will be spent on a 200-mile road running across the Malayan Peninsula. Meanwhile Japan has announced a $657-million road program which will pave 3,600 miles of highway and make another 22,640 miles passable for vehicles.

• **$2.7-billion for England's roads**—The first major highway improvement program launched since 1939 has been announced by the British government. To take several years, the $2.7-billion plan calls for widening, repair, and straightening existing roads and bridges, and for building by-pass roads around congested towns.

• **Venezuelan hydro**—The Venezuelan Ministry of Development has approved the vast Caroni River Falls hydroelectric project. Situated in the state of Bolivar, the falls are part of the region where the Orinoco Mining Co., a U. S. Steel subsidiary, has dredged a river, built a harbor and a city, and run a railway and a highway to the "iron mountain"—Cerro Bolivar. Initial surveys and studies, costing $300,000 have been completed by Burns and Roe, New York.

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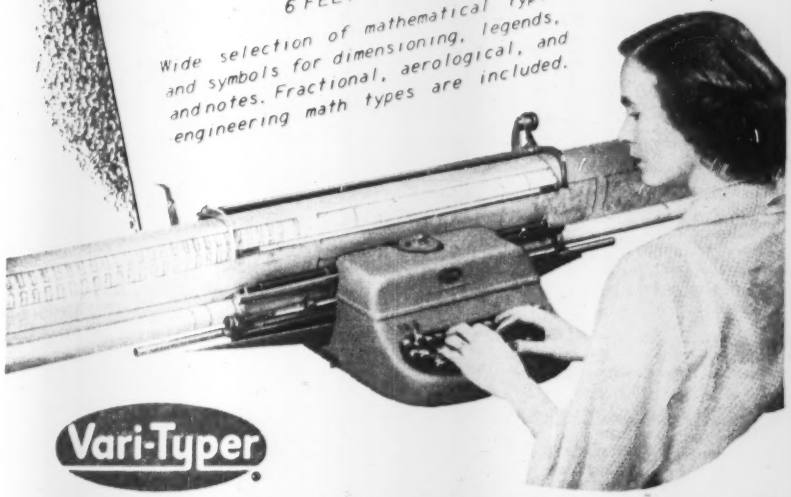

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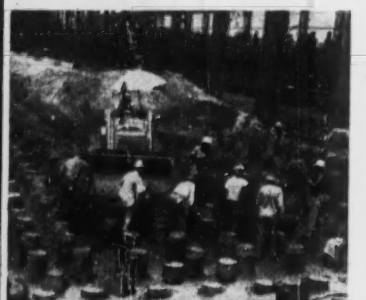
what's NEW in Engineering

A synthetic soil conditioner has been announced which helps to control rain and wind erosion on construction sites, levees, rights of way and similar "bare ground" sites. Designed to stabilize aggregates on the soil surface, it helps to hold seeds and soil in place until vegetation cover takes over the job.

Deep-sea divers joined a small army of engineers and construction crews in driving over 42,000 piles at a riverside site for a Louisiana plant—to provide a stable foundation in mushy ground. Divers, working 40 feet down in the Mississippi River, were required to direct



placement of the concrete seal. We'll send you a 32-page illustrated book which tells how Kaiser Engineers is equipped to meet challenging problems—like this one at the nation's largest aluminum plant, which was producing metal in just 10 months.

A pocket pyrometer, now on the market, gives direct reading of temperatures up to 3,300 deg. F. Only six and one-half inches long, it weighs about five ounces, and is shaped like a miniature telescope.

Whether it's designing an oil refinery, building a porcelain enameling plant or laying out a site plan, Kaiser Engineers undertakes the job with assurance because of the variety of talent within the organization. Successful experience in a wide field of design, engineering and construction tells the story. Call or write: Kaiser Engineers Division of Henry J. Kaiser Company, Kaiser Building, Oakland 12, California.

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Grover Godfrey, showman at heart, puts exhibits on organized basis with Texas flourish

Grover A. Godfrey, for years a showman and sales promoter known to home builders all over the country, has gone full-time into a line of work that makes him one of the foremost promoters of a product everybody loves—the American home.

Godfrey resigned last month as executive vice-president of the Dallas Home Builders Assn., to give full time to his own organization, National Home Shows, Inc., which puts on forty home shows a year from Corpus Christi, Tex., to Calgary, Alta., and from the deep Southeast to the Pacific Northwest. Most of his shows, like the original one in Dallas, are promoted by local Home Builders Assns., but in some localities they are sponsored by the Chamber of Commerce, Jaycees, Real Estate Board, a service club or a newspaper.

A typical home show will run from five to nine days, feature anywhere from 60 to 200 exhibits, and charge a head fee ranging from $1 downward (In some communities it's free). It will display the latest thing in household goods, from new model dishwashers and TV sets to draperies and slip covers. Building materials get big play, whether they are a new kind of house siding or a termite-proof foundation pier.

Back in the 1920s, home shows were sporadic, one-man promotion jobs. Today, enjoying their greatest vogue, they are run by professional organizations, of which Godfrey's is perhaps the largest.

• **Springboard to success**—Godfrey organized the Dallas Home Builders Assn. in 1943 and ran it for ten years, boosting it to fifth largest in the country. It was through his efforts that the Dallas group became one of the first to put on a home show after World War II.

Within a couple of years, the success of the Dallas shows had spread Godfrey's fame and enabled him to set up shows in Fort Worth, St. Louis, Cincinnati, Denver, Atlanta, El Paso and San Antonio. Godfrey organized National Home Shows, Inc., because as he said, "We sensed the need of some central organization that could develop and plan shows for other cities."

The position as operating boss of the DHBA gave Godfrey a rostrum from which to spread the home show gospel, and his own service. The biggest NHS shows now are in Dallas, San Antonio, New Orleans, Tacoma, Denver, and Calgary and Edmonton, Alta., with smaller shows at almost every point of the compass.

Godfrey couldn't do it all himself. He now has twelve show managers, each of whom sets up three or four shows per year. Each manager, working under Godfrey's general guidance, is the local show's executive, showman, salesman, public relations and advertising man all rolled into one. "We're limited only by not having enough managers," says Godfrey. "If I had the men I could put on any number of shows this year."

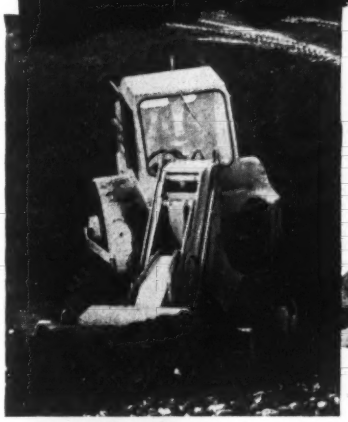
Good managers aren't easy to find, he says, because they have to be businessmen, diplomats and "showmen at heart." The best ones have had previous trade show or fair experience. Godfrey insists that his new managers work through one or two of his shows as underlings, to study the pattern of the shows, before they can begin to put on their own.

• **Behind the scenes**—Godfrey visits the site of a proposed show months ahead of time, conferring with the sponsoring agency, deciding whether the trade area can support a home show, arranging for space in an auditorium or exhibition hall. He signs the contract with the sponsoring agency, leases the space, provides for full insurance coverage. Then, a couple of months before the show, one of NHS' managers goes to town and starts working on the details. By the time the show date comes around, Godfrey has visited a dozen other cities, laying the groundwork for his managers to take over there.

The manager lays out and sells exhibit space, advertises and promotes the show, sets up electrical connections for the exhibitors and the drapery for the booths. He also arranges for professional entertainers who will perform as an added attraction.

National Home Shows guarantees the sponsoring agency 10% of gross revenue, which runs between $40,000 and $50,000 for the average show. Ad-

HIGH-STEPPING WORK HORSES



Working stability on uneven ground is job-tested feature of LD 5 Scoopmobile. Hydraulically operated bucket digs effortlessly, has exceptional "break out" action for fast loading.

Powerful Dozermobile tractor-dozer literally glides over rough terrain, with all four wheels working under positive power. Axle oscillation is 20°. The big 14:00x24 pneumatic tires give added traction and flotation, permit highway transport of vehicle at speeds up to 16 mph.

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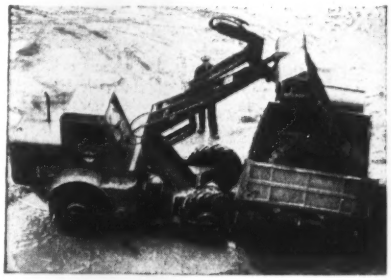
With exclusive POW-R-FLEX twist-turn oscillating flexibility—plus the added advantages of 4-wheel planetary drive, 4-wheel power steer, and all-hydraulic operation—these rugged Scoopmobile front-end loaders and Dozermobile tractor dozers offer mobility, maneuverability, and stability that no other machine can match.

Your Mixermobile representative has complete information regarding these and other outstanding features for profitable bulk materials handling. Or he may be able to direct you to projects where you can see these versatile machines in action. It will pay you to see him soon.

*Patented and patents pending



Pow-R-Flex twist-turn flexibility saves maneuvering time in spotting bucket for both digging and loading. Result—more work per working shift.

Dozermobile (Model DM 1): 8-cylinder 180 h.p. Chrysler V-8 industrial engine*—Ten speeds forward and reverse—15" ground clearance—18,000-lb. drawbar pull (calculated, 1st gear).

Scoopmobile (Model LD-5): 6-cylinder 114 h.p. Chrysler industrial engine*—Eight speeds forward and reverse—All hydraulic operation—Bucket discharge height, 9 ft.—Capacity, 1 cu. yd., struck.

Scoopmobile (Model LD-10): 8-cylinder 180 h.p. Chrysler industrial engine*—Ten speeds forward and reverse—All hydraulic operation—Bucket discharge height, 9 ft., 6 in.—Capacity, 1⅛ cu. yd., struck

*Diesel power optional at extra cost

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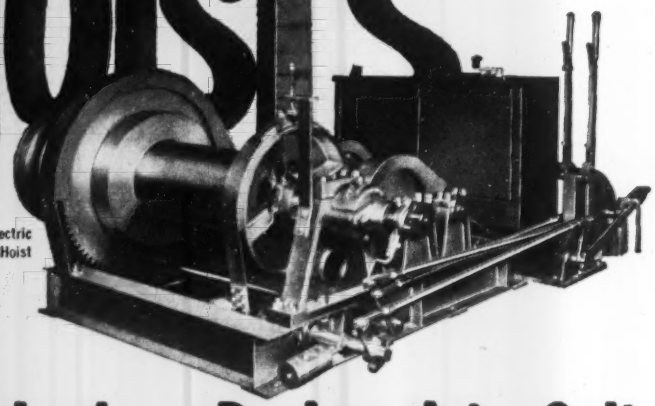

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vantages of its service which home builder groups seem to like best are the experienced, easy-to-deal-with management; the assured return; and the way the details are handled by NHS instead of being dumped on local committees.

The manager first lays out floor space for the more important booths, at $1.50 to $1.50 per sq ft rental. One-third of total floor space goes into aisles, for fast crowd circulation. Then space is sold—to big exhibitors first, for they set the pattern and help bring in the little fellows. Major appliance manufacturers often share expenses with local dealers. Direct-mail campaigns to local merchants sell considerable space.

A month before the show opens, the NHS manager starts his advertising campaign, using billboards, radio and TV, and special sections in local newspapers. A committee of the sponsoring organization gets the mayor to open the show, and helps set up promotions such as homemaking contests. Local exhibitors boost the show in their ads.

Two or three days before the opening, the hall looks like Santa Claus' workshop, with hundreds of exhibitors and helpers hammering, arranging and rearranging their space. The NHS manager stays on the floor during this crucial time and during the entire run, soothing tempers and working out compromises. For the exhibitors it's hard work with no assurance that the display will pay for itself, but most of them believe it well worth the investment, however, to create a market for the future.

Godfrey manages to drop in on every NHS show during its run, but by then things are moving pretty smoothly and he is needed mostly for good will or to cut an occasional top-level Gordian knot. In the fall he and his managers start work on the spring shows set for Dallas, San Antonio, Canton and Youngstown, Ohio, and Tacoma.

In all, they've put on more than 200 shows in more than 50 cities in seven years.

• **Showman at heart**—At 62, Godfrey is a natural in his line of work. He was orphaned at the age of six, grew up in the little Ohio town of Montpelier with an eye always peeled for a way to make money. He got into touring summer theatricals at 10, played in stock companies through the Midwest in "Peck's Bad Boy" and other attractions. He "newsbutched" on the Wabash Railroad the summer of the

Louisiana Purchase Exposition in St. Louis in 1904.

He stayed in high school until a talent for short story writing got him into several big city newspapers. He went to Oklahoma at 15 as a full-fledged reporter on the strength of some of this writing. A wholesale grocer in Oklahoma soon convinced Godfrey that selling was his line, and before long he was touring the western part of the state in a horse and buggy, calling on merchants. He became sales manager of the firm at 18, and stayed in sales promotion in the grocery business and allied lines until, at 30, he went to Washington for a two-year stint as national field secretary for the American Wholesale Grocers Assn.

Godfrey returned to the Dallas-Fort Worth area and got back into sales promotion work, later becoming executive vice-president of the Associated Distributors and Producers of Texas. He went into real estate development promotion in the 1930's, and from that springboard organized the Dallas Home Builders Assn.

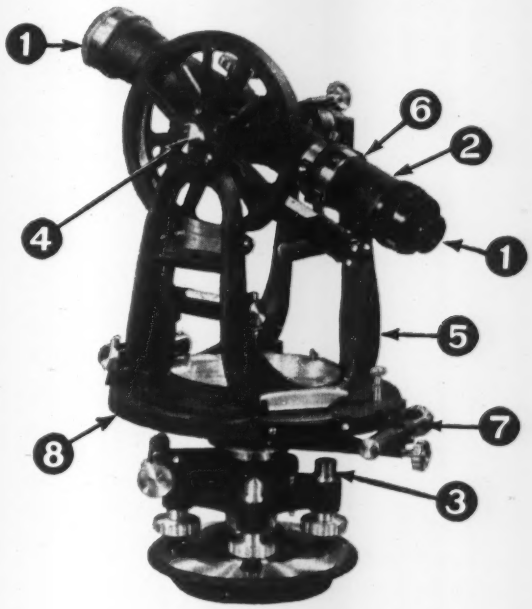
Godfrey has written several books on sales promotion that bristle with references to Victory, Success and Championship. All these words seem to apply to his record with home shows, a booming new enterprise which this year is expected to draw a total of 10 million Americans into attendance and into bigger spending on their homes.

Careers . . .

• **Appointments**—The American Institute of Steel Construction has named two new district engineers: **A. R. Wright,** who will be in charge of the Pittsburgh, Pa., office, and **E. W. Gradt,** who will head the Syracuse, N. Y., office . . . **Christy Hallien** has been promoted to chief engineer of the Leodding Engineering Co., Inc., Ambridge, Pa. . . . The American Society for Testing Materials has appointed **Fred F. Van Atta** as a special assistant on the Philadelphia headquarters staff. He was building division manager of the Carolinas branch of the Associated General Contractors . . . **R. O. Bair** has been named pilot plant superintendent for Rubarite, Inc., at Magnet Cove, Ark. He was resident engineer there during construction of the plant by Austin Co. of Cleveland. **Jewell R. Benson,** former special projects engineer of The Asphalt Institute, has been appointed chief engineer of Rubarite with headquarters in Denver . . . Iowa State College has made three appointments in its civil engineering department. Asso-

Ask the man behind the gun...

How these 8 major design advances make White the top engineers' transit



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MEN AND JOBS

ciate professors: E. **Robert Baumann,** former research associate at the University of Illinois, and **Cornie L. Hulsbos.** Assistant professor: **Paul E. Morgan,** former sanitary engineer with the Iowa Department of Health . . . **Clyde E. Haager** has been named chief engineer for the Ohio Concrete Manufacturers Assn. He was construction superintendent for the Christopher Construction Co. in Columbus, Ohio . . . Two new appointments in the college of engineering at the University of Dayton: **Dr. Joseph Gabrys,** assistant professor of civil engineering, and **Oskar Hauenstein,** assistant professor of engineering drawing . . . **O. F. Sieder,** executive vice-president and general manager of H. K. Ferguson Co., Inc., of Cleveland, has been named president of the construction firm's new Canadian subsidiary in Toronto. **E. A. Charlton,** former president and general manager of the Central Paper Co., Inc., Muskegon, Mich., will be vice-president and general manager for Ferguson in Canada . . . **J. H. Gilbert** has been appointed executive vice-president of the Capitol Engineering Corp. of Dillsburg, Pa. He was a captain in the Navy's Civil Engineer Corps, last stationed as district civil engineer of the Potomac River Naval Command in Washington, D. C. . . . **D. B. Gumensky,** after three years as chief of design on Israel's water development, has returned to this country to open an office as a consulting engineer in Berkeley, Calif., on hydro-power, water supply, dams and tunnels. Formerly with the Metropolitan Water District of Southern California, he was also consultant to the pre-Communist Chinese government on the proposed Yangtze Gorge project.

• **Retired—Charles R. Sansbury** of Louisville, Ky., has retired from the engineering division of the Army Corps of Engineers . . . **Frederick L. Copeland** has retired as vice-president and director of Bates & Rogers Construction Corp.

• **Resigned—Anthony P. Gawronski** has resigned as Wisconsin director for the Federal Housing Administration.

Honored—Joseph B. Brooks, consulting engineer, St. Louis, has been awarded the professional degree of civil engineer by Washington University, the subject of his thesis, "The Role of the Consulting Engineer in Right-of-Way Condemnation." Mr. Brooks received his bachelor of science degree in civil engineering from the same university in 1942.

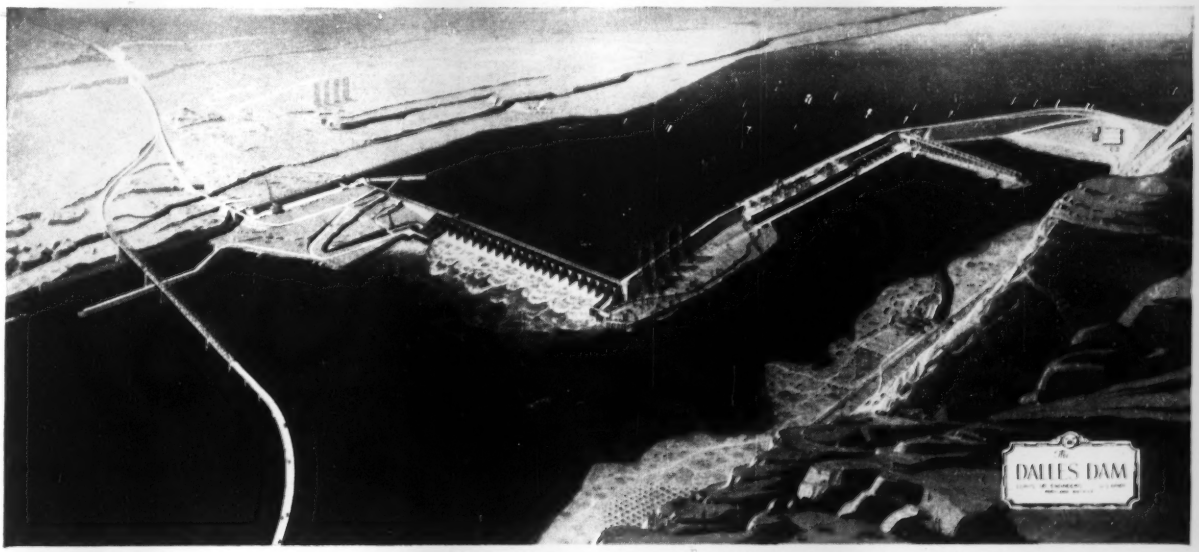
COMING UP...1,733,200 hp

Excavation for "The Dalles" Dam and Powerhouse Starts as Baldwin-Lima-Hamilton Begins Manufacturing the World's Most Powerful Adjustable Blade Propeller Turbines

THE DAM AND POWERHOUSE at The Dalles begin to take shape as this huge earthmoving equipment goes to work.

Work is now under way in Baldwin-Lima-Hamilton Corporation's Eddystone (Pa.) plant on the first of the fourteen hydraulic turbines they are manufacturing for the Corps of Engineers, U. S. Army, project at "The Dalles." The most powerful adjustable blade propeller turbines in the world, each is rated 123,800 horsepower, 85.7 rpm under 81-ft head. Delivery of these turbines is scheduled to extend through July 1959.

Meanwhile construction of the dam and powerhouse is progressing at The Dalles, Oregon, which is located on the Columbia River between the Bonneville and McNary Dams. When completed in 1960, this project will fulfill a dual purpose. Aside from being a power development, it is also the Corps of Engineers' fourth stage of development of the Columbia River in the interest of navigation at The Dalles.



THE DALLES DAM Ultimately the power house will contain 22 Hydraulic Turbines with a total rated capacity of 2,723,600 hp.

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Long, long, trouble-free service is a feature of "Century" asbestos corrugated that makes it the ideal roofing and siding for many types of structures.

"Century" corrugated is made from asbestos fiber and portland cement, and so combines the advantages of both materials. It is strong, dense and tough. It *cannot* burn, rot, or corrode. It resists weather, vermin, and insects. And—here's an especially well-liked feature—it needs practically no maintenance during its long life, and it *never* needs protective paint. But that's not all!

"Century" asbestos corrugated is made in standard length sheets up to 12 feet that are easy to handle and store, easy to cut and fit, easy to erect. When TOPSIDE* Fasteners are used, no scaffolding is needed within the building, thereby saving additional time and money.

All these outstanding advantages make long-lived "Century" asbestos corrugated sound like a premium-priced building material. Actually it is one of the most economical materials you can specify!—low in application cost, low in maintenance expense.

Before you build, modernize, or expand a plant, get all the details on "Century" asbestos corrugated! We shall gladly send you complete information.

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RESEARCH

Concrete testing to be subject of international meeting

An international symposium on non-destructive testing of concrete has been scheduled for Paris, during the week beginning Jan. 10, by the International Union of Testing and Research Laboratories for Materials and Structures, known as RILEM (from the initials of its name in French).

According to the president of RILEM, Prof. Inge Lyse of Trondheim, Norway (formerly director of the Fritz Engineering Laboratory at Lehigh University), the Paris meeting was approved and arranged by the representatives of the 15 countries who attended the recent annual convention of the organization at Lisbon, Portugal. General subjects on the symposium program are sonic tests, superficial hardness tests and tests by means of gamma rays and neutrons. Additional information may be obtained from Robert l'Hermite, director, Laboratoires du Batiment et des Travaux Publics, 12 rue Brancion, Paris (15), France.

Release interim report on travel of water pollution

After two years of investigation, the Sanitary Engineering Research Projects of the University of California has released an interim report on its extended study of the travel of water pollution with ground water movement.

Although the studies will be continued for some time, the principal conclusions that may be drawn from the findings to date are:

(1) Pollution travel is most rapid and extensive in the direction of ground water flow.

(2) With regard to the use of recharge as a means of waste water disposal and ground water replenishment, highly treated water may be recharged at appreciable rates for long periods without difficulty from well clogging.

(3) Coliform bacteria quickly reach what may prove to be a maximum distance. In the investigation, this distance was 100 ft and no buildup of concentration occurred in 41 days of injection of polluted water.

(4) The reduction of bacterial numbers with distance from the point of injection is extremely great. In the investigation the reduction was from one million to less than 38 organisms per 100 ml while traveling 100 ft in 33 hours.

(5) The clogging of an aquifer may

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Master Model B-160 Super-Space Heater high output for smaller heating jobs

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NEW MASTER SUPER-SPACE HEATER SPECIFICATIONS

MODEL NO.	CAPACITY	*SAFETY	BURNER	FUEL
B-160	160,000 BTU per hour	Indications of carbon monoxide in the exhaust gases of the kerosene fueled Master Space Heater was less than 0.001 per cent by volume . . . as tested by an independent testing laboratory. According to accepted standards this content is one tenth of the amount considered hazardous.	Master Gun Type	Kerosene, No. 1 Fuel Oil or No. 2 Fuel Oil
B-240	240,000 BTU per hour			
B-400	400,000 BTU per hour			

(Continued)	FUEL CONSUMPTION	HOT AIR OUTPUT	CONTROLS	SIZE	WEIGHT
B-160	1.14 per hr.	1100 C.F.M.	Thermostat for full automatic temperature control. Fuel tank safety control.	W-24½" L-58" H-34"	166 lbs. less fuel
B-240	1.71 per hr.	1900 C.F.M.	Thermostat for full automatic temperature control. Fuel tank and burner safety control.	W-29" L-60" H-39"	250 lbs. less fuel
B-400	2.85 per hr.	3500 C.F.M.		W-33" L-72" H-45"	311 lbs. less fuel

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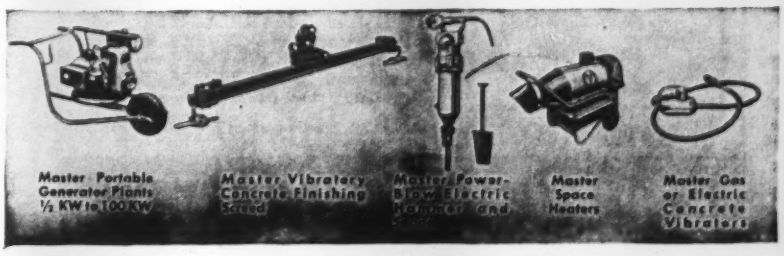
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occur with great rapidity if a dispersible clay exists in a stratum into which imported water with an unfavorable proportion of exchangeable ions is injected. Recharge wells are likely to fail unless gravel packed or otherwise equipped to reduce velocities past movable particles in the aquifer.

Harold B. Gotaas, director of Sanitary Engineering Research Projects, in recommending the continuation of the project, stated that the test installation is capable of rendering more information on ground water pollution travel than was originally intended.

The results of the project are of potential value in areas where ground water depletion exceeds natural recharge since, to quote Mr. Gotaas, "An obvious source of water for artificial recharge is the millions of gallons of treated sewage and other waste waters now being discharged into the ocean each day. But this source is usable only if no health hazard is created and providing that the physical difficulties of continuously injecting reclaimed waste water underground are neither insurmountable nor too costly to be practicable.

"The recharge of ground waters with oil field brines and with cooling waters has been moderately successful, but whether or not the constituents of sewage effluents might impose physical limitations and health hazards remains to be determined.

P. H. McGauhey is assistant director of SERP and Ray B. Krone is the project engineer. Andrew A. Dinos is assistant project engineer.

Financing has been supplied by the State of California through the State Water Pollution Control Board.

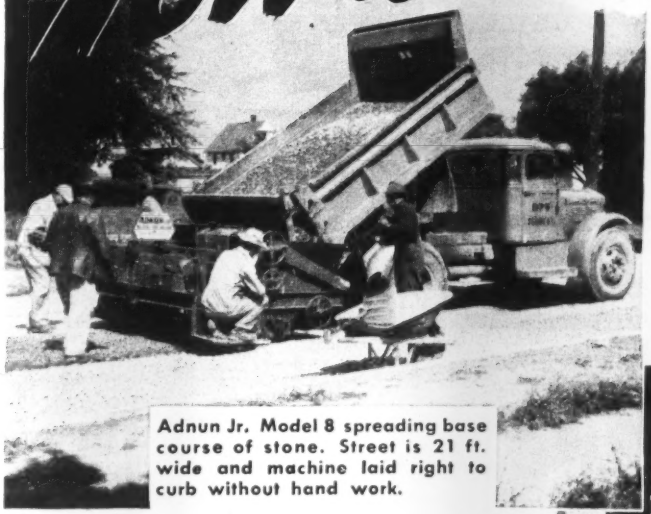
Compile damage data from air attack

The Federal Civil Defense Administration has released a major study conducted by Stanford Research Institute on the effects of air attacks during World War II.

A section of the nine-volume study deals with physical damage and points out that "Japanese experience and experiments in the U. S. have demonstrated that it is possible to provide simple and relatively inexpensive shelter at reasonable distances against the blast and the prompt radiation effects of an atomic explosion. Any advantage could be lost, however, if provision has not been made to protect survivors from the ensuing dangers of fire and residual radiation."

The Institute of Research, Lehigh University, participated in the project through subcontract.

How to do a BETTER JOB of STREET PAVING



Adnun Jr. Model 8 spreading base course of stone. Street is 21 ft. wide and machine laid right to curb without hand work.

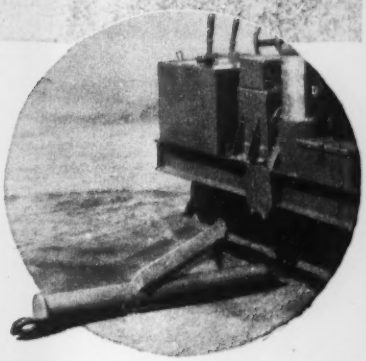
THE NEW ADNUN JR MODEL 8 BLACK TOP PAVER

HERE is a street job in New York State. The Adnun Jr. handled all of the spreading on this from stone base to finished top course. The Adnun Jr. is a highly engineered, quality, precision, tow-type paver that is far superior to the usual hopper on wheels now being used for non-specification work. The advantages of the Adnun Jr. assure greater accuracy in course thickness, improved density and better joints with a material reduction in hand work.

Its ability to maneuver without load saves time on relocations. The powered Breaker Bar in the Hopper assures better compaction. The Oscillating Toothed Cutter Bar, with overlapping action, cuts the course off at the right thickness without troweling fats to the surface and makes a tighter joint without hand work. A smooth course surface which approaches that of larger pavers, results from the Adnun principle of Continuous Course Correction.

These are only a part of the long list of Adnun Jr. advantages in performance and design. You should know all about them. Let us send you a folder on it today.

After stone course was shot with oil, Adnun Jr. laid the asphalt surface in two courses in 7 ft. sections. The machine is here laying the binder.



The Adnun Jr. is easily moved. A removable Trailer Hitch permits lifting the unit with the truck body hoist and towing it anywhere with the paver rolling on its own front wheels.

ADNUN JR MODEL 8

BLACK TOP PAVER

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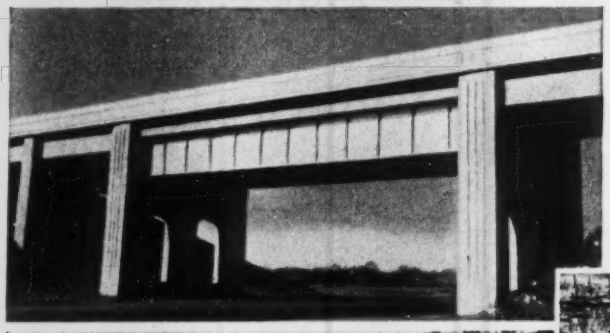

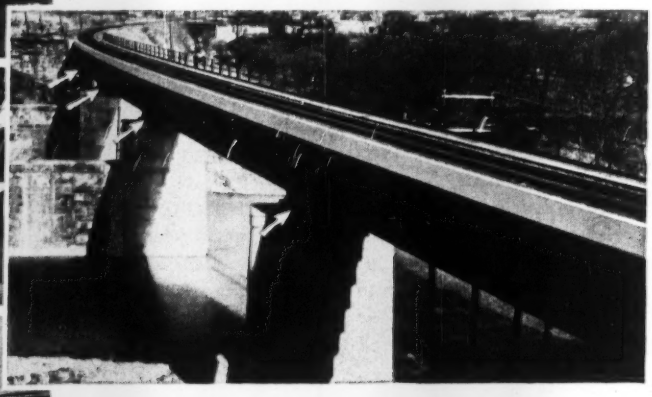

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FABREEKA is the most efficient, economical and durable material to use for distributing bearing loads evenly and for absorbing impact shock and vibration.

Proven by 18 years of Service in Heavy Industry

FABREEKA should be used wherever heavy impact shock and vibration are encountered in Bridges and Bridge Structures.

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NEW YORK • CHICAGO • DETROIT • SPARTANBURG • PHILADELPHIA • PITTSBURGH

Sewers, cement and surfboards

LEAKING JOINT is first calked with lead wool.

QUICK-SETTING hydraulic cement is held over the leak.

When one of Honolulu's 24-in. sewers beneath the fairways of the municipal golf course started to leak after a mild earthquake, Foreman Ismile Espaniola and his crew of the Maintenance Section, Division of Sewers, used their knowledge of surfboards and hydraulic cement to come up with a method of repairing ground water leaks under seven feet of head.

Maneuvering their "surfboards" within the 24-in. pipe running ¼ to ½ full, they float materials and tools to the leaking joint. A quick-setting hydraulic cement is kneaded in at the point of use—sewage or infiltrated water is used as a source of water. The cement mortar is immediately applied to the joint and held until it gains sufficient strength. When necessary the volume of incoming water may be reduced somewhat by calking the break with lead wool.

Sections of pipeline that have been repaired months ago show no leakage and a permanent repair is anticipated. HARRY C. FINLEY, ENGINEER IN CHARGE OF CONSTRUCTION, DIVISION OF SEWERS, DEPT. OF PUBLIC WORKS, HONOLULU 13, T. H.

WELLMAN *Williams Type*

PERFORATED DRAGLINE BUCKET

speeds the wet jobs

● You get big loads fast with this Wellman Perforated Dragline Bucket because excess water goes out while gravel stays in on jobs such as illustrated.

Built of special alloy steel—all welded for strength plus light weight. You can work faster with less maintenance with Wellman dragline buckets.

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CONTRACTORS' OFFICE TRAILER

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LEGAL

Defects in work

An architect is not liable for defects in the work resulting from instructions given to the contractor by the owner. This is especially so where the architect, during the course of construction advised the owner that the instructions given by him to the contractor would cause defects in the work.

"Where the owner has independent relation to the contractor, the architect, of course, does not warrant the construction. He can do no more than warn the owner of defective workmanship or materials or of failures to conform to specifications."[1]

"In the preparation of plans and specifications, the architect must possess and exercise the care and skill of those ordinarily skilled in the business; if he does so, he is not liable for faults in construction resulting from defects in the plans, as his undertaking does not imply or guarantee a perfect plan or a satisfactory result, it being considered enough that the architect himself is not the cause of any failure, and there is no implied promise that miscalculations may not occur. Where, however, the architect does not possess and exercise such care and skill he will not only be liable in damages for defects in his plans but he cannot recover compensation for them."[2]

(1) Gaastra v Holmes, 10 P. 2d 589, 36 N.M. 175.

(2) White v Pallay, 247 P. 316, 119 Or. 97, quoting from 5 Corpus Juris 269.

Plans and specifications as part of contract

Where a contract provides that the work is to be performed pursuant to the plans and specifications, work called for by either the plans or specifications, though not mentioned in one, is covered by the contract and must be performed as a contract requirement.[1]

(1) E. W. Ulrich Glass Co. v. Interstate Electric Co., 132 So. 363, 171 La. 836.

Ownership of plans

"An architect ordinarily has no right to the ownership of a plan furnished to, accepted by, and paid for by another, and plans forming an essential part of the building contract, unless proved to be the property of the architect, are deemed to be the property of the employer."[1]

(1) Berlinghof v Lincoln County, 257 N.W. 373, 128 Neb. 28, quoting from 5 Corpus Juris 259.

(These summaries of court decisions are prepared by I. Vernon Werbin, New York attorney and civil engineer.)

OBITUARIES

Thomas Marsh Davis, Sr., 71, district engineer for the U. S. Bureau of Public Roads in Oregon when he retired in 1951, died Oct. 23 at Portland, Ore. He became highway engineer for Klickitat County, Wash., in 1905, and joined the Oregon highway dept. in 1913 and the bureau in 1917.

Russell Suter, 75, former executive engineer and secretary of the State Water Power and Control Commission in Albany, N. Y., died Oct. 27. He joined the commission in 1919, holding the dual position at time of his retirement in 1949. He was a graduate of Massachusetts Institute of Technology and was employed by the civil government of the Philippine Islands for four years. He then served on the New York City Board of Water Supply until 1910 when he went with the New York State Water Supply and Conservation Commission.

Douglas M. Chadwick, 67, city and district engineer for the Canadian Bridge Co., and the Canadian Transmission Tower Co., died Oct. 21 in Montreal, Que. He was formerly with the Dominion Bridge Co., the St. Lawrence Bridge Co., the Maritime Bridge Co., and the late W. Chase Thomson, consulting engineer.

Everett N. Hutchins, 69, district waterworks engineer of the Massachusetts Department of Public Works, for 18 years secretary of Boston Society of Civil Engineers and its vice-president in 1947, died at Salem, Mass., Oct. 26. He was graduated from Harvard in 1908; joined the DPW in 1913 and was promoted to his late post in 1942.

William T. Backstrom, 49, San Francisco Bay Area building contractor, died Oct. 21. A veteran of 25 years in the construction business, he was a partner in the B and R Construction Co., San Francisco, which he founded in 1945. Previously he was superintendent for Moore & Roberts, Inc., San Francisco. Mr. Backstrom's firm sponsored and operated the $4.5-million Dugway Proving Grounds project in Salt Lake City, built Marin Junior College at Kentfield, Calif., and Shasta Junior College at Redding, Calif., and supervised projects throughout California, Washington, Oregon and Utah.

John L. Starkie, 68, a retired civil engineer, died Oct. 11 in Fort Worth, Tex. He had worked for the Santa Fe Railway for 45 years.

NEW *McConnaughay*
MULTI-PUG ASPHALT MIXER

REMOVES BOTH MOISTURE AND SOLVENTS

MODEL HTD-500

Prepares Hot or Cold Bituminous Mixtures—¼ Ton Capacity

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McConnaughay HTD-500 at work on street patching job in Cheyenne, Wyoming.

K. E. McCONNAUGHAY
LAFAYETTE 2, INDIANA

CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. O. WETZEL, L. M. WINISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Fanning & Doorley Constr., Inc.,** 274 Kinsley Ave., Providence, R. I., CA, **$1,046,055,** water supply imprvs., BROCKTON, MASS. City, Water Dpt., City Hall, Brockton, Mass. Bids Oct. 14. CD 10/20, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Neri Constr. Co.,** 131 Main St., Millbury, Mass. CA **$1,274,000,** Alt 1 **$60,000,** est. $1,000,000. Tantasqua Regional District SCHOOL, STURBRIDGE, MASS. Towns of Sturbridge, Brookfield, Brimfield, Wales and Holland, Tantasqua Regional Distr. School Comn., Sturbridge, Mass. CD 9/22, under LB.

▲ **Gilbane Building Co.,** 90 Calverly St., Providence, R. I., CA **$1,500,000.** Proj. 50-538, GYMNASIUM rear of Harkins Hall, PROVIDENCE, R. I. Providence College, Rev. Robert J. Slaven, pres., River View Ave., Providence, R. I. Bids Oct. 6. CD 9/15.

▲ **Frouge Construction Co.,** 74 Goodsell St., Bridgeport, Conn., LB, **$1,093,000,** Proj. B/A R-103 vocational technical school, NORWICH, CONN. State, Ralph G. Macy, State P. Wks. comr., State Office Bldg., Hartford, Conn. Bids Oct. 28. CD 9/22.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

† **N. Y., Geneseo**—HEATING—B.A. 11/16—Dpts. of Army & Air Force National Guard Bureau, Office of Actg. U. S. Property & Disbursing Officer, State of New York, 201 64th St., Brooklyn, Zone 21, addnl. heating in garage in concentration site shop, State Armory Site, Serial No. NG-30-192-54-6.

New York—POWER EQUIP.—B.A. 11/27—New York City Transit Auth., 370 Jay St., Brooklyn, Zone 1, furnishing, installing power equip. for Flushing Line, IRT Div., Manhattan and Queens Boros; and Liberty Avenue line, IND Div., Queens Boro. CD 7/14/49, under N. Y., Brooklyn.

N. Y., New York—COAL and ASH HANDLING STRUCTURES—B.A. 11/27—New York City Transit Auth., 370 Jay St., Brooklyn, Zone 1, general constr.; electrical work; heating and ventilating; plumbing for coal and ash handling structures for 74th Street Power Plant, Manhattan Boro.

BIDS ASKED—BUILDINGS

▲ **N. Y., Jamaica**—NURSES RESIDENCE, etc.—B.A. 12/2—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, general constr., plumbing, heating, ventilating and refrigeration work, electrical work for constr. of nurses' residence and school, Queens General Hospital, Queens Boro. $3,985,000. Plans deposit $50. CD 8/17/45.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany,

Jesse F. Howes, Sidney Center, N. Y. LB **$1,017,395,** est. $1,114,000. reconstr. 18-ft. bit. macad. 7.33 mi. Cat Hollow Rd. between Roscoe and Downsville Dam, constr. four new bridges over Spring Brook, Delaware Co. Bids Oct. 29. CD 10/5.

Watson-Flagg Engr. Co., 140 Cedar St., New York 6, N. Y. CA **$766,508,** rehabilitation of tracks and installation contact rail Culver Yard and part of Culver line, Culver Line Rehabilitation, BROOKLYN, N. Y. New York City Transit Auth., 370 Jay St., Brooklyn 1, N. Y. Bids Oct. 23. CD 10/7.

MARYLAND—State Rds. Comn., 108 E. Lexington St., Baltimore, Zone 2.

Bero Engr. & Constr. Corp., Box 477, Hampton, Va., LB **$316,354,** Contract F-537-7-715, dual steel I-beam bridges, concrete deck, piers and abutments to carry relocation U.S. Route 40 over 2 tracks of B. & O. R. R. near Ridgeville, Frederick Co. Bids Oct. 27. CD 10/14.

MARYLAND—State Rd. Comn., 108 E. Lexington St., Baltimore, Zone 2.

Cumberland Constr. Co., Box 507, Cumberland, Md., LB, **$74,843,** Contract A 435-5-615, wid'n., resurf. 1.16 Mi. State Route 33, Miller to Midland, Allegany Co. Bids Oct. 27. CD 10/14.

† **Rogers & McGrath, Inc.,** 1221 Kenilworth Ave. N.E., Wash. D. C., LB, **$164,657,** Base Bid; Alternate addn. **$39,918** water purification plant addns., Eng-409-080-54-10-(1), CAMP DETRICK, MD. U. S. Eng., First and Douglas Sts. N.W., Wash., 35, D. C. Bids Oct. 27. CD 9/25.

H. T. Campbell Sons Corp., Towson, Md., LB, **$89,705** Contract 53122-RX, road imprvs., TOWSON, MD. Comrs. Baltimore Co., Court House, Towson, Md. Jos. A. Baldwin, c/o owner, engr. CD 7/13.

Dover Builders, Inc., Dover, Del. LB, **$119,205,** sanitary sewers in Wilmington Manor Gardens Sectors A and B, WILMINGTON, DEL. President of Levy Court, New Castle Co., Public Bldg., 11 and King Sts., Wilmington, Del. Bids Oct. 27. CD 10/14.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **MacArthur Constr. Co.,** 101 Park Ave., New York 17, N. Y. CA **$2,000,000.** 17 story APARTMENT, Fifth Ave. and 75 St., NEW YORK, N. Y. Weiler & Glickman, 50 E. 42 St., New York 17, N. Y. Harman Assocs., 1860 Broadway, New York 23, N. Y., archts.

N. B. Dullenkoft Co., 323 Filbert St., Bethlehem, Pa. LB **$119,100,** est. $95,000, ELECTRICAL constr. at State Warehouse and Garage, 21 and State Sts., HARRISBURG, PA. General State Auth., 18 and Herr Sts., Harrisburg, Pa. Bids Oct. 28. CD 10/21.

▲ **H. B. Alexander & Son, Inc.,** 315 Vaughan St., Harrisburg, Pa., CA **$3,000,000.** 242x702 ft. assemblage WAREHOUSE, 4 mi. west of Harrisburg on Cumberland branch of Pennsylvania R. R. at St. John's Church Rd. intersection (northwest corner) just north of SHIREMANSTOWN, PA. Quaker Oats Co., Merchandise Mart Plaza, Chicago 54, Ill. CD 9/29.

Kahn Eng. Co., 427 O St. S.W., Wash., D. C. LB, **$410,000** 5 story, bsmnt., brick, concrete, steel NURSES HOME;

Cogswell Constr. Co., 512 Park Ave., Baltimore, Md., LB, **$129,550,** masonry, steel STORES BLDG.;

Wildberger-Best Constr. Co., 2025 E. North Ave., Baltimore, Md., LB, **$538,850,** NURSES HOME and STORES BLDG. combined, University Hospital, Lombard and Greene Sts., BALTIMORE, MD. State Dpt. P. Imprvts., 506 Park Ave., Baltimore, Md. Bids Oct. 27. CD 10/20.

Small Acres Constr. Co., Inc., 6100 Edmondson Ave., Baltimore, Md. Separate Contracts. $300,000, 25 brick DWELLINGS, Edmondson Ave. and Small Acres, west of BALTIMORE, MD.

Ranch Leigh, Inc., Towson, Md. Separate Contracts. **$722,000.** 38 brick DWELLINGS Farrington, Beancroft, Hanway and Edenvale Rds., BALTIMORE, MD.

Jack Meyerhoff & Sons Co., 900 Court Square Bldg., Baltimore, Md. Separate Contracts. **$305,000,** 42 masonry HOUSES, 7200 block of Gough St., east of BALTIMORE, MD.

Norman E. Earley, Hagerstown, Md., CA, **$480,000** masonry, concrete, steel elementary SCHOOL, Smithburgh, HAGERSTOWN, MD. Bd. Educ., Washington Co., Hagerstown, Md. Chap & Lefler, Hagerstown, archts. CD 11/21.

▲ **Charles E. Smith Co.,** 1425 N. St. N.W., Wash. D. C., CA, **$1,000,000.** five to thirteen story, crete, brick APARTMENTS, incl. 135 units, 2601 Woodley Place N.W., WASH., D. C. Calvert-Woodley Inc., 1425 H St. N.W., Wash., D. C. Corning & Moore, 1726 M St. N.W., Wash., D. C., archts.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction
(Name in order of Listing)

Water Supply	Latin America
Sewers, Waste Disposal	Public Buildings
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects invloved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
B.A.	Bids Asked
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

† **Florida**—B.A. About 11/24—U. S. Eng., P.O. Box 4970, Jacksonville, constr. of Canal and Levee 15, Section 2 (Hillsboro Canal) Central and Southern Florida Flood Control Proj. CIVENG-08-123-54-18. CD 11/24/43.

† **Louisiana**—B.A. 11/25—U. S. Eng., foot of Prytania St., New Orleans, parish road relocation and access road, Plaquemines Parish, Inv. 5474. CD 6/26/46, under Earthwork. etc.

La., Gretna—B.A. 11/30—Jefferson Parish Road District 1, Court House, Sections B, C, D of Veterans Memorial Highway, Over **$200,000.** Plans deposit $100. Palmer & Baker, P.O. Box 346, Mobile, Ala., engrs.

† **Fla., Orlando**—QUARTERS—B.A. On Or About 12/8—U. S. Eng., P.O. Box 4970, Jacksonville, bachelor officers' quarters and misc. work, Pinecastle Air Force Base, Serial No. Eng-08-123-54-27. CD 1/31/51.

BIDS ASKED—BUILDINGS

▲ **Va., Richmond**—HOUSING UNITS—B.A. 11/18—Methodist Children's Home, Rev. E. Leon Smith, supt., 3900 W. Broad St., two housing units for children. Total est. $1,400,000 J. Binford Walford, 103 E. Cary St., archt. CD 3/23.

† **S. C., Fort Jackson**—BUILDINGS REHABILITATION—B.A. 11/20—Purch. & Contg. Officer, Fort Jackson, rehabilitation buildings 2401, 2402, 2403, 2406, 2413, Inv. No. (FJGDD-PC-38-042-54-78).

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Cramer-Vollmerhausen Co., Inc.,** 2601 Connecticut Ave., N. W. Wash., D. C., LB **$4,221,700,** electrical and electronics bldg., Norfolk Naval Shipyard, NOY 70226. Spec. 30149, PORTSMOUTH, VA. P. Wks. Office, Headquarters Fifth Naval Dist., U. S. Naval Base, Norfolk, Va. Hayes, Seay, Mattern & Mattern, 609 S. Jefferson St., Roanoke, Va., and Harley, Ellington & Day, Inc., 153 E. Elizabeth St., Detroit, Mich., engrs.-archts. CD 9/16.

NORTH CAROLINA—State Hy. & P. Wks. Comn., Raleigh,

Wannamaker & Wells, Inc., Box 542, Orangeburg, S. C., LB **$131,793,** est. $125,000-$150,000. two overflow bridges for Cape Fear River US 701, just north of Elizabethtown, Proj. 3082, F-244 (4), Bladen Co. Bids Oct. 27. CD 10/16.

| **NORTH CAROLINA**—State Hy. & P. Wks. Comn., Raleigh,

Dickerson, Inc., Box 448, Monroe, N. C., LB **$329,502,** est. $300,000-$400,000, CABC, bit. surf. tr. 10.57 mi. U. S. 17 from NC 33 in Washington, north to Martin Co. line, Proj. Nos. 1006, S.F. 473 (4), S.F. 473 (5), F-473 (6), F-473 (7), Beaufort Co.; LB **$60,001,** est. $50,000-$75,000, CABC, bit. surf. tr. and structures 2.77 mi. from point on Lands Ford Rd. 1 mi. west of Beulah Church, north to beginning of pavement, approx. 9 mi. south of Monroe, Proj. 7-454, S-735 (1), Union Co.;

F. D. Cline Paving Co., Box 349, Raleigh, N. C., LB **$165,753,** est. $175,000-$200,000, grading, subgrade reinf., CABC, bit. surf. tr. and structures 12 mi. NC 305 from end of 22 ft. asph. pavement aporox. 7 mi. north of Windsor, northwest to A.C.L. R.R. in Aulander, Proj. 1077, S 549 (2), S-549 (3), Bertie Co.;

Barnhill & Long, Inc., Tarboro, N. C., LB **$79,695,** est. $75,000-$100,000, grading 7.18 mi. from NC 37 at Belvedere north to Joppa, Proj. 1-702, S-476 (3), S-476 (2), Perquimans and Gates Counties;

Propst Constr. Co., Inc., Concord, N. C., LB **$231,874,** est. $250,000-$300,000. SABC and bit. surf. tr. 7.16 mi. US 64, from east end of bridge over Yadkins River, east to junction with Lexington By-Pass just outside city limits of Lexington, Proj. No. 5201, F-278 (5), Davidson Co.;

Blythe Bros. Co., Box 989, Charlotte, N. C., LB **$287,-743,** est. $300,000-$400,000, CABC and bit. surf. tr. 3.83 mi. NC 7 from Gastonia east to point in Lowell Proj. 6306, S-172 (2), Gaston Co.;

Clement Bros. Co., Inc., Lenoir, N. C., LB **$249,496,** est. $250,000-$300,000, CABC, bit. surf. tr. 2.55 mi. relocation of U.S. 129 from railroad bridge in Topton and extending toward Robbinsville Proj. 9300 S-346 (4), Graham Co. Bids Oct. 27. CD 10/16.

E. N. Murray, Buena Vista, Ga., CA, **$78,185,** water distr. sys. addn., GRIFFIN, GA. City, City Hall Griffin, Ga. Bids Oct. 27. CD 9/23.

† **Hardaway Contg. Co.,** 15 11 St., Columbus, Ga., LB, **$515,569,** half-mile rubble at extensions of Canaveral Harbor Jetties, Canaveral Harbor, FLORIDA. U. S. Eng., P.O. Box 4970, Jacksonville, Fla. Bids Oct. 22. CD 8/24.

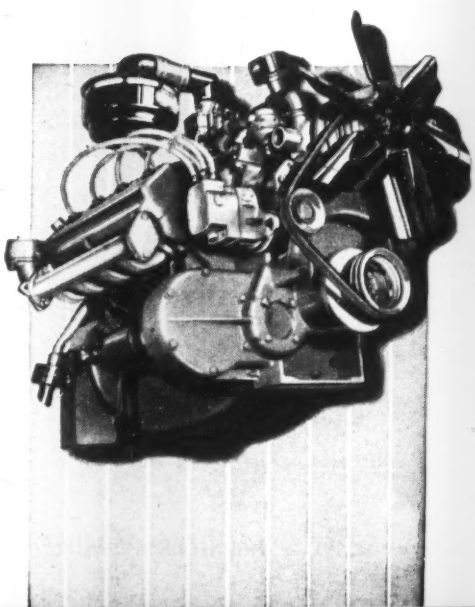
MISSISSIPPI—State Hy. Dpt., Jackson,

Boyd Constr. Co., Grenada, Miss., CA, **$69,759,** est. $81,000, grading, drainage bridge 0.798 mi. Miss. Hy. No. 19 between West and Kosciusko, S-0642 (2) A, Attala Co.; Bids Oct. 27. CD 10/15.

(Continued on page 80)

Photo courtesy Hale Fire Pump Company, Conshohocken, Pa.

Chrysler Power provides modern solution to age-old problem of irrigation



Early last summer, the owner of this 640-acre farm near Williamsburg, Virginia, decided to irrigate 120 acres. Taking his water from the nearby James River, he irrigated 70 acres of corn, 50 acres of soy beans. Water was pumped at the rate of 960 gallons per minute, fourteen hours a day, seven days a week. Each acre required approximately 36,000 gallons.

The results were astounding. Not only did this farmer save his crops during an especially dry summer, but his corn and soy bean yields actually *increased* 100% over the year before. In each case, 1952 was considered a normal year.

What this farmer did with his Hale Model CIRV Pump demonstrates again the effectiveness of Chrysler Power. Here the 331-cubic-inch displacement Model 20 V-8 Engine is used because the manufacturer wants great power with light weight, continuous, economical operation.

Manufacturers find Chrysler Engines ideal for almost any equipment requiring extra power without extra weight. Manufacturers also find they can order engines equipped *by Chrysler* to meet the needs of the equipment and their customers. For example, Chrysler Engines can be supplied with gasoline, natural or liquid propane gas burning carburetors, standard or gear-driven front ends, 12 or 24 volt electrical system.

Chrysler Industrial Engines are not expensive. Production line methods, adapted to specialized industrial engine building, provide a custom-built engine at mass-production prices. See a Chrysler Industrial Engine Dealer, or write: ***Dept. 711, Industrial Engine Division, Chrysler Corporation, Trenton, Michigan.***

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R. D. COLE MFG. CO.
NEWNAN, GA., Established 1854
TANKS • TOWERS • VESSELS
CYLINDERS

(Continued from page 78)

MISSISSIPPI—State Hy. Dpt., Jackson,
J. W. Snowden Constr. Co., P.O. Box 161, Hattiesburg, Miss., CA, $167,645, est. $190,000, culverts, box bridges, bridges 3.701 mi. Miss. Hy. No. 32 between Okolna and Van Vleet, S 0799 (1) A., Chickasaw Co. Bids Oct. 27. CD 10/15.
Anderson Bros. Corp., 707 N. Drennan St., Houston, Tex., CA, $785,000, approx. 85 mi. gas gathering lines;
Associated Pipe Line Contractors, Inc., 3272 Westheimer St., Houston, Tex., CA, $544,180, approx. 70 mi. gas gathering lines;
Williams Bros. Co., 4910 Toulouse St., New Orleans, La., CA, $628,815, approx. 75 mi. gas gathering lines between Lake Charles and Gulf Coast Area, LOUISIANA. Gulf Interstate Gas Co., c/o Panhandle Eastern Pipe Line Co., 120 Broadway, New York, N. Y. Grand total $1,958,000. CD 3/27/52, under Texas, Louisiana-Mississippi-Tennessee and Kentucky.
▲ **KENTUCKY**—Commonwealth of Ky., Dpt. Hys., Frankfort,
Davidson & Cocke, Mayfield, Ky., LB, $109,215, traffic bound 5.803 mi. RS 92-564, The Adaburg-Deanefield Rd., S 279 (2), Ohio Co.; LB $113,145, traffic bound 9.281 mi. RS 114-548 The Bowling Green-Polkville-Hydro Road, S-506 (2) Warren Co.;
The Allen Co., Inc., Winchester, Ky. LB, $156, 002, b. conc. 0.658 mi. SP 56-158, SP 56-118, various sections of Eastern Parkway in Louisville, Jefferson Co.; LB, $185,401, bit. 0.478 mi. SP 56-58, Lexington Road in Louisville (Louisville-Shelbyville Rd.), Jefferson Co.;
Greenville Quarries, Inc., Greenville, Ky., LB, $70,498, traffic bound 4.858 mi. RS 14-613 The Rockvale-Hy. 261 Rd., S-527 (1), Breckinridge Co.;
Geo. H. Cheek Constr. Co., McClure Bldg., Frankfort, Ky. LB, $162,075, traffic bound 2.97 mi. SP 29-127 The Burkesville-Glasgow Rd., F-116 (9), Cumberland Co.;
Licking River Limestone Co., West Liberty, Ky., LB, $120,960 traffic bound 5.059 mi. RS 48-268, The Bledsoe-Pine Mountain Rd., S-239 (2), Harlan Co.;
Marlowe Constr. Co., Inc., Delaware Ave. Exten., Lexington, Ky., LB, $156,602, traffic bound limestone 7575 mi. RS 66-232 The Bearbranch-Sizerock Rd., S0514 (1), Leslie Co.;
Breslin Constr. Co., 1433 S. Preston St., Louisville, Ky., LB, $122,852, bit. 2.535 mi. SP 56-748, Goss Avenue-Logan Street-Campbell Street In Louisville, SP 56-748, Jefferson Co.;
Kentucky Road Oiling Co., Frankfort, Ky., LB, $87,433. traffic bound limestone 7.027 mi. RS 45-511 The Schultz Creek-Three Prong Rd., Greenup Co. Bids Oct. 23. CD 10/7.
J. B. McCrary Co., Atlanta Federal Bldg., Atlanta,, Ga. CA $79,279, raw water supply lines, GREENEVILLE, TENN. City, Greeneville, Tenn. Bids Oct. 22. CD 10/1.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Bradlee Towers**, 3810 King St., Alexandria, Va. Owner Builds. Approx. $1,250,000. 2 story, bsmnt., 218 unit masonry Braddock Lee APARTMENTS, ALEXANDRIA, VA. Joseph H. Saunders, Jr., 121 S. Columbus St., Alexandria, Va., archt.
Quaker Lane Apartment Corp., Quaker Lane, Alexandria, Va. Owner Builds. $650,000. 3 story, masonry 96 unit Quaker Lane APARTMENTS, ALEXANDRIA, VA. Edmund W. Dreyfuss, 1019 15th St. N.W., Wash., D. C., archt. CD 10/14.
† **Lang Constr Co., Inc.**, Hampton, Va., LB $824,000. DINING HALL and KITCHEN BLDG. NO. 116 (domiciliary) and BLDG. 93 alterations, Veterans Admin. Center, KECOUGHTAN, VA. Veterans Admin., Munitions Bldg., Wash., D. C. Bids Oct. 27. CD 9/2.
▲ **J. A. Jones Constr. Co.**, 209 W. 4 St., Charlotte, N. C., CA, $1,500,000. 9 story OFFICE, Biltmore Ave., ASHEVILLE, N. C. Caswell Co., E. P. Coston, pres., Asheville, N. C. Louis H. Asbury & Sons, Asheville, N. C., archts.
T. A. Loving & Co., P.O. Box 989, Goldsboro, N. C. LB, $565,485. 115 HOUSING units, GOLDSBORO, N. C. Goldsboro Housing Auth., Goldsboro, N. C. Bids Oct. 27. CD 10/8.
C D. Spangler Constr. Co., P.O. Box 3007, Charlotte, N. C. CA, $565,000. Chesterfield and Edwards Elementary SCHOOLS, CHESTERFIELD, S. C. Chesterfield Co. Bd. Educ., Chesterfield, S. C. Bids Oct. 20. CD 10/29.
Jordan Contg. Co., Andrews Road, Columbus, Ga., LB, $961,000. PSYCHIATRIC BLDG., at State Hospital, MILLEDGEVILLE, GA. State Dpt. P. Welfare, State Office Bldg., Atlanta, Ga. Bids Oct. 27. CD 10/5.
▲ **Chemical Construction Corp.**, 485 Madison Ave., New York, N. Y. CA, $14,000,000. titanium dioxide PLANT, SAVANNAH, GA. American Cyanamid Co., Calco Div., Bound Brook Rd., Bound Brook, N. J. Robert & Co., 96 Poplar St. N.W., Atlanta, Ga., archts. and engrs. CD 10/13.
Construction Engineers, Jasper, Ala., CA $304,777, COURT HOUSE addn., SCOTTSBORO, ALA. Jackson Co., Scottsboro, Ala. Bids Oct. 27.
Grant Parish Police Jury, Colfax, La., rejected bids Oct. 17, COURT HOUSE addn., COLFAX, LA. LB, $312,380. Will re-advertise. CD 10/27, under LB.
E. B. Ludwig Constr. Co., 1350 Jefferson Hy., New Orleans, La., CA, $133,000, mfg. PLANT, NEW ORLEANS, LA. Rex Enterprises, 3725 Dauphine St., New Orleans, La.
▲ **Vitro Corp. of America**, 233 Broadway, New York 7, N. Y., project manager and engineer awarded contract to **Turner Construction Co.**, 420 Lexington Ave., New York, N. Y., CA, $25,000,000, titanium PLANT, CHATTANOOGA, TENN., for Cramet, Inc. (sub. Crane, Inc.), 836 S. Michigan Ave., Chicago, Ill. CD 9/8, under CA.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

▲ **Ind., Hammond and East Chicago**—RAILROAD IMPRVS.—Bids Asked—Chicago, South Shore & South Bend R.R., F. J. Corporon, supt. Ways and Structures, Michigan City, part of grading railroad right-of-way relocation and constr. bridges, grading. Total est. $1,500,000. CD 9/16.

BIDS ASKED—BUILDINGS

▲ **Ill., Chicago**—PARKING GARAGE—B.A. 11/23—City, City Hall, parking garage, Wacker Dr. and State St. $1,900,000. Shaw, Metz & Dolio, 208 S. LaSalle St., Zone 4, archts. De Leuw, Cather & Co., 150 N. Wacker Dr., Zone 6, engrs. CD 2/27.
▲ **Ill., Chicago**—APARTMENTS—B.A. 11/30—Illinois Institute of Technology, 35 W. 33 St., two apartments. $2,280,000. Ludwig Mies Van de Rohe, 230 E. Ohio St., Zone 11, archts. Pace Assocs., 53 W. Jackson Blvd., Zone 4, assoc. archts. CD 10/13.
Ind., South Bend—SCHOOL—B.A. 12/14—School City of South Bend, Administration Bldg., 228 S. St. Joe St., grade school, E. Benedict and N. Menora Sts. $800,000. Plans deposit $25. Andrew A. Toth, 2158 Portage St., archt. Bevington, Taggart & Fowler, K of P Bldg., Indianapolis, engrs. CD 2/10.
Ill., Aurora—FACTORY—Bids Asked—Richards-Wilcox Co., Aurora, 30,000 sq. ft. factory addn. $750,000. Johnson & Johnson, 111 W. Washington St., Chicago, Zone 2, archts.

SOON LETS CONTRACT—BUILDINGS

Ill., Chicago—FACTORY—Bagcraft Corp., 4501 S. Kildare St., soon lets contract, 30,000 sq. ft. factory addn. $180,000. A. Epstein & Son Co., 2011 Pershing Rd., Zone 9, archt.
▲ **Ill., Cicero**—FREIGHT HOUSES, etc.—Chicago, Burlington & Quincy R.R., H. R. Clarke, ch. engr., 547 Jackson Blvd., Chicago, Zone 6, soon lets contract two 1 and 2 story, 60x1400 ft., freight houses, also one 50x1400 ft. at Morton Park Station, $4,000,000. Shaw, Metz & Dolio, 208 S. La Salle St., Chicago, Zone 4, archts. CD 12/1.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Kenny Constr. Co.**, 3220 Oakton Ave., Skokie, Ill., CA, $1,265,000. Central South Side sewers, Greenwood Ave., 74 to 76 Sts., Dodson Ave., 76 to 82 Sts. CHICAGO, ILL. City, City Hall, Chicago, Ill. Bids Aug. 17, awarded Oct. 21. CD 7/28.
▲ **City**, City Hall, Joliet, Ill., returned bids unopened received Oct. 26, sewage treatment plant works intercepting sewers, water mains, JOLIET, ILL. $2,000,000. Will re-advertise. CD 10/21.
John G. Yerington, Benton Harbor, Mich., CA $147,781. 9.27 mi. bit. aggregate, 20 ft. wide with binder, widening and wedging, Redbud Trail, BENTON HARBOR, MICH. Bd. Rd. Comrs., Berrien Co., 1121 Milton St., Benton Harbor, Mich. Bids Oct. 9. CD 10/2.
John G. Yerington, Benton Harbor, Mich., CA $87,000. bit. aggregate 5.44 mi., two culverts, Three Oaks Rd., in Chikaming, BENTON HARBOR, MICH. Bd. Rd. Comrs., Berrien Co., 1121 Milton St., Benton Harbor, Mich. Bids Sept. 18.

BUILDINGS

LOW BIDS AND CONTRACTS

† **G. E. Mitchell**, Marion, Ind., LB, $276,633. LAUNDRY BLDG. No. 79 addn., Veterans Administration Hospital, MARION, IND. Veterans Admin., Munitions Bldg., Wash., D. C. Bids Oct. 27. CD 9/25.
Frank Rogas, Delaware St., Merrillville, Ind. Owner Builds. $650,000. 60 HOMES, MERRILLVILLE, IND.
▲ **M. A. Spooner**, 510 N. Dearborn St., Chicago 10, Ill., CA, $1,500,000. 125 HOMES, W. 14 St., CHICAGO, ILL. Murray Hetherington, Byron & Jillson, Agents, 820 Broad St., Beloit, Wis. Awarded Oct. 23.
▲ **Irving Rootberg**, 3841 W. Devon St., Chicago, Ill. Owner Builds. $1,175,000. thirteen 104-unit APARTMENTS, CHICAGO, ILL.
J. Emil Anderson & Son, 1809 Balmoral Ave., Chicago 40, Ill. CA, $220,000. 28,000 sq. ft. FACTORY, CHICAGO, ILL. Kilbourn Building Trust, 1809 Balmoral St., Chicago 40, Ill. Awarded Oct. 19.
J. Emil Anderson & Son Co., 1809 Balmoral St., Chicago 40, Ill., CA, $800,000. WAREHOUSE, OFFICE, 4923 LeMoyne Ave., CHICAGO, ILL. Sears, Roebuck & Co., S. Homan and Arthington St., Chicago, Ill. Awarded Oct. 20.
Wm. Gade & Son, 5716 Newcastle Ave., Chicago, Ill., CA, $500,000. 23 HOMES in area 2000 W. Farwell Ave., CHICAGO, ILL. Sidney Glassberg, 2056 W. Devon St., Chicago, Ill. H. E. Anderson, 7915 S. State St., Chicago, Ill., archt. Awarded Oct. 22.
Sherman Olson, Inc., 219 N. Kilpatrick St., Chicago 51, Ill., CA, $750,000. 2 story, face brick RESEARCH LABORATORY, WOODSTOCK, ILL. Morton Salt Co., 120 S. La Salle St., Chicago 3, Ill. Bids Oct. 14, awarded Oct. 26. CD 10/13.
▲ **Lerner-Linden Constr. Co.**, 9940 Roselawn St., Detroit, Mich., CA $1,311,000. Contr. FD-11, 1 story, 105,000 sq. ft. brick, concrete SHOP and STORAGE BLDG., Russell, Erskine, Riopelle and Wilkins Sts., DETROIT, MICH. City, Charles C. Creedon, pres. Bd. Fire Comrs., Guardian Bldg., Detroit 26, Mich. Bids Aug. 18, awarded Oct. 27.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

† **Neb., Lincoln**—HOMING BEACON—B.A. 11/18—U. S. Eng., 1709 Jackson St., Omaha, radio homing beacon, Lincoln Air Force Base, Inv. 25-066-54-6. CD 10/28, under LB.

† **Tex., Big Spring**—AUXILIARY AIRFIELD—B.A. 11/20—U. S. Eng., Box 1538, Albuquerque, N. M., constr. Auxiliary Airfield, incl. 123,000 sq. yd. asph. paving, 150,752 cu. yd. excav. in Martin Co. near Stanton, Inv. No. 29-005-54-35. $375,000. Extended date. CD 10/27.

† **Mo., Sedalia**—HOSPITAL—B.A. 12/22—U. S. Eng., 601 Davidson Bldg., Kansas City, 50-bed hospital, Sedalia Air Force Base, ENG-23-028-54-29. Plans deposit $50. J. Gordon Turnbull, 112 E. 10 St., Kansas City, Mo., engr. CD 9/29, under LB.

BIDS ASKED—BUILDINGS

Mo., St. Louis—HIGH SCHOOL—B.A. 11/24—Bd. Educ., City of St. Louis, c/o V. Harry Rhodes, comr. School Bldgs., 911 Locust St., Zone 1, rein.-con., brick, steel, stone technical high school, 5101 Northrup Ave., vicinity of McRee and Hereford Aves. Plans deposit $25. F. Ray Leimkuehler, c/o owner, archt. CD 6/11/51.

Mo., Bland—SCHOOL—B.A. 11/25—Gasconade Co. School Dist. R-3, Bd. Educ., Marjorie Farris, secy., Bland, elementary school and facilities, etc. Barnes & Snipes, Architects and Associated Engineers, 436A Vine St., Poplar Bluff, archts.

† **Tex., El Paso**—HEADQUARTERS—B.A. About 12/7—U. S. Eng., P.O. Box 1538, 2108 Central Ave. S.E., Albuquerque, N. M., six 1 story, each approx. 2,600 sq. ft. rein.-con. and masonry office bldgs., incl. outside electrical work, sidewalks and topsoiling, Fort Bliss, Serial No. Eng-29-005-54-40. CD 7/6/51.

▲ **Tex., Harlingen**—HOSPITAL—B.A. 12/8—Bd. for Texas State Hospitals & Special Schools, 45 and Lamar Sts., Austin, 198,000 sq. ft. rigid steel frame State Tuberculosis Hospital, 6 ward bldgs., and other allied bldgs., steam heating, etc. $2,700,000. H. Newell Waters, 1st Natl. Bank Bldg., Weslaco, archt. Walter C. Moore, 45 and Lamar Sts., Austin, superv. archt. Francis J. Niven, 3903 Main St., and Rivoire & Poole, 2506 Richton St., Houston, engrs. CD 4/21.

SOON LETS CONTRACT—BUILDINGS

Tex., San Antonio—SHOPPING CENTER—L. R. Pletz, c/o Marmon & Mok Assocs., Archt. and Planning Consults., 320 S. Texas Bldg., soon lets contract Loma Linda Shopping Center. $300,000. Beretta, Greenslade, Clark & Collins, Inc., 902 Travis Bldg., engr. CD 10/7.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Lindquist & Olson, Cambridge, Minn. and **Belview Cement Co.,** Belview, Ia., CA **$66,573.** constr. County Ditch No. 14-1, excav., drain tile sect. concrete pipe, REDWOOD FALLS, MINN. Redwood Co., I. R. Rogers, aud., Redwood Falls, Minn. Bids Sept. 25. CD 9/10.

† **U. S. Eng.,** 1709 Jackson St., Omaha, Neb. cancelled bids to have been opened Oct. 27, oil circuit breakers, Gavins Point Reservoir Proj., near Yankton, Inv. 25-066-54-53, SOUTH DAKOTA. CD 9/29.

KANSAS—State Hy. Comn., Russell,
Adrian Schweitzer, Osborne, Kan., CA, **$97,630** grading 4.737 mi. 18-84-S1063 (4), Part 1, Russell Co. Bids Oct. 22. CD 10/8.

KANSAS—State Hy. Comn., Chanute,
Rhoades Constr. Co., Inc., Newton, Kan., CA, **$96,494** Bridge 99-37-13.7, Station 459 plus 50, 99-37 F 059-1 (1), Greenwood Co.;
The Maxwell Bridge Co., Columbus, Kan., CA, **$65,080** Bridge 59-2-1166, Station 621 plus 30.17, 59-2 F 067-2 (2), Anderson Co. Bids Oct. 30. CD 10/8, under Streets and Roads.

KANSAS—State Hy. Comn., Chanute,
Henry Henery, Inc., Ottawa, Kan., CA, **$97,023** grading 5.28 mi. 59-2 F 067-2 (2), Anderson Co.;
Freeto Constr. Co., Inc., Pittsburg, Kan., CA, **$85,975,** c. conc. 0.288 mi. 59-67-U-067-1 (3) Pt. 1, Neosho Co. Bids Oct. 23. CD 10/8.

KANSAS—State Hy. Comn., Russell,
King Constr. Co., Hesston, Kan., CA, **$137,315,** Bridge 181-71-8.9 Station 46 plus 25, 181-71-S-345 (7) and Bridge 181-71-9.5 Station 75 plus 70, 181-71 S-345 (7), Osborne Co. Bids Oct. 22. CD 10/8, under Streets and Roads.

Central Texas Electric Co-operative, Fredericksburg, Tex. Force Account **$77,500,** 40 mi. rural distr. lines, Fredericksburg area, Gillespie Co., TEXAS. CD 11/16/50.

Davy Crockett Rural Telephone Co-operative, Eugene Scott, pres., Trinity, Tex. Own Forces. **$95,000,** some rural pole telephone lines, Crockett area, Trinity and Walker Counties, TEXAS. CD 6/19.

Victoria County Electric Co-operative, Victoria, Tex. Own Forces. **$70,000,** rural distr. lines, Victoria area, Victoria Co., TEXAS. CD 5/6.

Central Power & Light Co., Laredo, Tex. Own Forces. **$125,000,** power line imprvs., and extens., Laredo area, Webb Co., TEXAS. CD 1/28.

† **H. B. Zachry Co. Constr. Div.,** Box 2570, San Antonio, Tex., LB **$191,242,** Lot "A"; **$216,944,** Lot "B", apron extens., Webb Air Force Base, Serial No. 29-005-54-20. BIG SPRING, TEX. U. S. Eng., Box 1538, Albuquerque, N. M. Bids Oct. 23.

Roger Smith, Waco, Tex., CA **$38,875,** water treatment plant unit, COPPERAS COVE, TEX. City, Cop-

ESTIMATING

Profit or Loss?

Machines Behind the Estimator Make the Difference!

Any contractor will admit estimating is the hardest part of any job! Before a single workman sets foot on the project site, before a single machine arrives, the job has to be figured to the minutest detail. The contractor wins the job on the strength of his bid. His bid has to be low, yet high enough to be profitable . . . accurate, yet flexible enough to allow for contemplated cost changes in labor, materials and machines.

• **One out of five** contractors goes broke every year. Many of these failures can be traced to improper estimating. The estimator must know quantities and prices of all materials to be used, number of hours of labor required, going wages, the amount of overhead, taxes, insurance and many other factors. A couple of bad guesses and he's in the red.

• **Estimating is Long Range Proposition.** Estimating the job starts two to six weeks before the letting of the contract. Often the estimate must be made months, and sometimes years, before the project is completed. Only a seasoned engineer can shoulder the responsibility. Even such a variable item as the weather has to be taken into consideration, for bad weather can slow down the job, increase costs.

• **Estimator Must Depend on Machines.** The rated power, speed and versatility of American equipment is common knowledge among qualified estimators. Knowing the work these machines can deliver day in, day out, the estimator that figures on American equipment often gives the lowest, most profitable bid . . . and, needless to say, get the job!

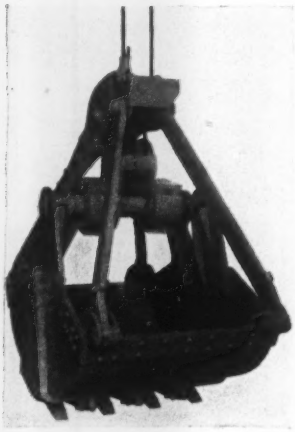
HELPFUL POINTERS

• To show contractors how American Hoist equipment cuts costs on the job, American Hoist offers you the "Crosby Clipper", a factual, interesting magazine full of illustrated on-the-job stories. For your regular issues, write American Crosby Clipper, American Hoist & Derrick Company, St. Paul, Minnesota.

It All Depends on the BUCKET AT THE END OF THE LINE . . .

The bucket is usually less than one-tenth of the whole investment in your materials handling equipment. Yet, to get all the pay load you should on every pass depends more on the bucket than on anything else.

To be sure you have the right bucket for the job, let our field engineers look over your set-up. There's no charge, and their recommendations will help you get the most out of a major investment.



Write for Bulletin 403, Dept. R113

ERIE
STEEL CONSTRUCTION COMPANY
2113 GEIST ROAD • ERIE, PENNSYLVANIA

Old Sewer Gets New Life with "GUNITE"

The picture at the left shows an old concrete storm sewer in Washington, D. C., badly disintegrated and honeycombed. Flow value was low due to roughness. This sewer was reconditioned by chipping away the worst areas, sandblasting the entire surface and applying a "GUNITE" lining.

The smooth brush finish increased its capacity sufficiently to meet all requirements, making it unnecessary to build a new sewer. The completed job is shown at the right.

Many money saving applications of "GUNITE" are described in our illustrated Bulletin A2400. Request on your letterhead will bring you a copy.

CEMENT GUN COMPANY
"GUNITE" CONTRACTORS
GENERAL OFFICES – ALLENTOWN, PA., U. S. A.
MANUFACTURERS OF THE CEMENT GUN

peras Cove, Tex. Reaves & Gregory, 3332 W. 7th St., Fort Worth, Tex., engrs. Bids Oct. 20. CD 11/26/52.

Houston Co., c/o Comrs. Court, Crockett, Tex. Own Forces. Some farm to market road work, **$65,000**, Hy. 45 to Cut Rd.; **$63,350**, on road towards Halls, 5 mi., CROCKETT, TEX. CD 8/20.

City, Edinburg, Tex. Own Forces. **$45,000**, water main exten. into outlying districts; **$42,500**, water filtration unit, EDINBURG, TEX. Winston, Sigler & Clark, Weslaco, Tex., engrs. CD 8/20.

Reising Constr. Co., Edinburg, Tex. CA **$89,100**, some flood control work, EDINBURG, TEX. Hidalgo Co., Edinburg, Tex. CD 7/30.

Baass Bros., Goliad Hy., Victoria, Tex., LB **$63,000**, sewage treatment plant imprvs., EDNA, TEX., City, Edna, Tex. Bids Oct. 26. CD 7/9.

Hudspeth Conservation & Reclamation Dist. 1, McNary, Tex. Force Account. **$100,000**, irrigation unit, FORT HANCOCK, TEX. CD 3/16.

City, Garland, Tex. Own Forces. **$65,000**, some addnl. sanitary sewer lines, GARLAND, TEX. CD 6/4.

City, Garland, Tex. Own Forces. **$48,500**, WW rehabilitation works, GARLAND, TEX. CD 6/4.

Houston Lighting & Power Co., 1016 Walker St., Houston, Tex., CA **$275,000**. addnl. unit of mercury vapor lighting standards on 2 main traffic arteries, HOUSTON, TEX. City, City Hall, 900 Brazos St., Houston, Tex. Frank Baldwin, Dir. P. Wks. Engr. CD 4/24.

Mischer-Harris Co., 6925 Navigation Blvd., Houston, Tex. LB **$61,118**, est. $63,115, 7 in. rein.-con. pavement, concrete curbs and gutters, **Belfort Ave.**, HOUSTON, TEX. City, City Hall, 900 Brazos St., Houston, Tex. Frank Baldwin, P. Wks. Engr. Bids Oct. 22.

City, Midland, Tex. Own Forces. **$78,000**, city park imprvs., expansion, Southside; **$85,000**, Northside, MIDLAND, TEX. CD 4/9.

City, Weimar, Tex. Force Account, **$6,775**, street imprvs., using some asphaltic materials, WEIMAR, TEX. Frank T. Drought, 117 W. Pecan St., San Antonio, Tex., engr.

City, Whitesboro, Tex. Own Forces. **$65,000**. sewage disposal unit, WHITESBORO, TEX. Carl C. Bentley, Fort Worth Natl. Bank Bldg., Fort Worth, Tex., engr. CD 8/26, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

Hagstrom Constr. Co., 1567 Shelby Ave., St. Paul, Minn. CA **$430,000**. general contract COUNTY JAIL, Kellogg Blvd. between St. Peter and Wabasha Sts., ST. PAUL, MINN. Ramsey Co., E. A. Monick, Aud., St. Paul, Minn. Bids Oct. 5. CD 10/13, under LB.

Warren Vatterott, 1500 S. Florissant Rd., Florissant, Mo. Owner Builds. **$750,000**. 84 semi-ranch HOUSES, southern exten. of S. Lafayette St., FLORISSANT, MO.

A. H. Haeseler Building & Contg. Co., 2346 Palm St., S. Louis 7, Mo., CA. 1 story, concrete, steel insulation COOLER and ZERO ROOM addns. to existing warehouse and office, ST. LOUIS, MO. Tom Boy Stores, Inc., 4353 Clayton Ave., St. Louis 10, Mo. Wedemeyer & Hecker, 111 N. 4 St., St. Louis 2, Mo., archts.

▲ **Sebco, Inc.**, 1011 Currie Ave., Minneapolis, Minn. CA, Red River Plaza SHOPPING CENTER, GRAND FORKS, N. D. Red Owl Stores, Hopkins, Minn. J. V. Vanderbilt, National Bldg., Minneapolis, Minn., archt. CD 10/28.

Samson Constr. Co., Salina, Kan., CA **$130,654**. 200,000 bu. GRAIN ELEVATOR, MARSHALL, OKLA. Farmers Co-operative, Marshall, Okla. Horner & Wyatt, Dwight Bldg., Kansas City, Mo. engrs. Awarded Oct. 26. CD 10/7.

▲ **J. M. Ddom**, Box 774, Austin, Tex., LB **$1,289,000**. general constr.;

C. Wallace Plumbing Co., Old Spanish Trail, Houston, Tex., LB **$889,800**, plumbing, heating, ventilating for constr. 1, 3 and 6 story, 65,000 sq. ft. addn. to Brackenridge HOSPITAL, general remodeling of present bldg., AUSTIN, TEX. City, Walter Seaholm, city mgr., City Hall, Austin, Tex. Bids Oct. 27. CD 10/13.

Tellepsen Constr. Co., 1710 Telephone Rd., Houston, Tex. CA **$94,414**, est. **$90,000**. partial steel frame, concrete block, concrete footings, grade beam, etc. VAULT BLDG., Traffic Dpt. Unit, FREEPORT, TEX. Texas Div. of Dow Chemical Co., Freeport, Tex. Bids Sept. 23. CD 9/15.

Brown Constr. Co., 5105 Avenue L, Houston, Tex., LB **$85,485**, est. $110,000. rein.-con. frame WAREHOUSE, rein.-con. drilled footings, grade beams and floor slab, HOUSTON, TEX. W. P. Cunningham Co., 1710 Esperson Bldg., Houston, Tex. Bids Oct. 21. CD 10/20.

Smith Building Co., Inc., P.O. Box 796, Waco, Tex., LB **$434,707**. Parochial Junior-Senior HIGH SCHOOL and SISTERS HOME, WACO, TEX. St. Mary's Catholic Church of the Assumption, 1401 Washington Ave., Waco, Tex. Bids Oct. 23. CD 10/7.

† **Lembke, Clough & King**, P.O. Box 455, Albuquerque, N. M., LB **$518,000**. Alt. add **$4,000**, three DORMITORIES for Shiprock School, SHIPROCK, N. M. Bureau Indian Affairs, Dpt. Interior, Interior Bldg., 19 and C Sts. N.W., Wash. 25, D. C. Bids Oct. 27. CD 9/17.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

† **Arizona**—TRANSMISSION LINES—B.A. 12/1—Bureau Reclamation, Dpt. Interior, Phoenix, 115-kv transmission lines from Saguaro Steam Electric Station to Phoenix-Tucson No. 2 Tap, ED 5 Sub-station and Oracle Sub-station, near Red Rock, Pinal Co., Spec. DC 4072; adv. ENR 11/12.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

WASHINGTON—State Hy. Comn., Olympia, **P. L. Saddler,** Wenatchee, Wash., CA, **$74,880,** draining, grading, surf. 6.1 mi. Reiman Rd. and other county roads, Grand Co.;

J. D. Shotwell, 3113 S. Pine St., Tacoma, Wash., CA, **$183,172,** draining, grading, surf. 6.4 mi. Hy. 5, Rimrock to Trout Lodge, Yakima Co.;

F. R. Hewett, Parkwater, Wash., CA, **$269,587,** bit. surf., rein.-con. girder bridge 10.1 mi. Hy. 7, Burke junction to Winchester, Grand Co. Bids Oct. 27. Grand total $527,639. CD 10/14.

▲† **Gunther & Shirley Co. and E. V. Lane Corp.,** Palo Alto, Calif., CA, **$3,419,357,** est. $4,167,106. installing power house equipment and complete power house at Chief Joseph Dam, Inv. 54-2, WASHINGTON. U.S. Eng., 4835 E. Marginal Way, Seattle 4, Wash. Bids Sept. 30. CD 10/5, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

Hainsworth Constr. Co., 3028 Western St., Seattle, Wash., LB, **$226,973,** 26,000 sq. ft., rein.-con. shipping WAREHOUSE on piling fdn., SEATTLE, WASH. Sick's Seattle Brewing & Malting Co., 3101 Airport Way, Seattle, Wash. Bids Oct. 23. CD 10/21.

Poston Constr. Co., 5619½ University Way, Seattle, Wash., LB, **$419,000,** three 1 story, steel, 35,000 sq. ft., West Seattle High SCHOOL addns., SEATTLE, WASH. School District No. 1, 814 4 Ave. N., Seattle, Wash. Bids Oct. 27.

CANADA

BIDS ASKED—HEAVY CONSTRUCTION

Que., St. Hubert—WORKSHOP—B.A. 12/1—Dpt. National Defence AIR, Ottawa, Ont., workshop bldg. at R.C.A.F. Station. Plans deposit $100. Defence Construction (1951) Ltd., 1247 Guy St., Montreal, engrs.

BIDS ASKED—BUILDINGS

Ont., Toronto—POLICE STATION, etc.—B.A. 11/23—City, City Hall, 2 story, bsmnt., T-shaped, 124x173 ft. police station and firehall, Dundas and Regents Sts., $300,000. Plans deposit $25. Craig & Madill, 734 Spadina Ave., archts. CD 10/28.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Grisenthwaite Constr. Co., Ltd.,** 637 Parkdale Ave. N., Hamilton, Ont., CA, **$1,100,000,** 125 HOUSING UNITS at Army Depot, COBOURG, ONT. Central Mortgage & Housing Corp., 40 Eglinton Ave. E., Toronto 12, Ont. Bids Sept. 30. CD 9/16.

Carroll Contg. Co. Ltd., 4135 Dundas St., Toronto, Ont., CA, **$500,000.** DEPARTMENT STORE and SHOPPING CENTER, Monaghan Rd., PETERSBOROUGH, ONT. Simpson-Sears Ltd., 176 Yonge St., Toronto, Ont. CD 7/22.

▲ **W. Rourke Ltd.,** 2 St. Sacremont St., Quebec City, Que., CA, **$1,400,000,** 163 DWELLINGS, Commissionaire Hy., QUEBEC CITY, QUE. Dr. Sam Pollack 557 St. Cyrille St., Quebec City, Que. M. M. Kalman, 1200 St. Alexander St., Montreal, Que., archt. CD 6/3, under CA.

ALASKA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Williams Bros. Co.,** Natl. Bank of Tulsa Bldg., Tulsa, Okla., **McLaughlin Co.,** Ford Bldg., Great Falls, Mont., and **Marwell Constr. Co. Ltd.,** 1500 W. Georgia St., Vancouver, B. C., CA **$29,001,288,** 610 mi. 8 in. Alaskan military petroleum products pipe line from Haines to Fairbanks, ALASKA. U.S. Eng., 3013 Arcade Bldg., Seattle 1, Wash. Bids Oct. 14. CD 10/16, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲† **J. H. Pomeroy & Co., Inc.,** 333 Montgomery St., San Francisco, Calif., CA **$1,236,440.** composite SHOP, Inv. 54-28, WHITTIER, ALASKA. U.S. Eng., Anchorage, Alaska. Bids Sept. 24. CD 9/30, under LB.

Proposed Projects

WATER SUPPLY

▲ **Ala., Mobile**—City, City Hall, filtration plant addn., **$1,200,000;** cleaning water mains, **$150,000;** new water supply main, **$1,700,000;** replacing worn-out water valves, **$100,000.**

Kan., Olathe—City, Fred Miller, water comr., voted **$590,000** bonds Oct. 20, reservoir on Cedar Creek, 170 acre lake for 1½ billion gal. on 370 acre site, 1,200 ft. earth and concrete dam, over 5 mi. 10 in. pipe to plant. Black & Veatch, 4706 Broadway, Kansas City, Mo., consult. engrs. Payne & Brockway, Olathe, owners' engr. CD 10/1.

▲ **Tex., Abilene**—City, Austin P. Hancock, mgr., Abilene. Job 1, WW sys. rehabilitation, **$175,000;** Job 2, rein.-con. ground water storage reservoir, **$150,000;** Job 3, pumping unit, **$100,000;** Job 4, c.i. water

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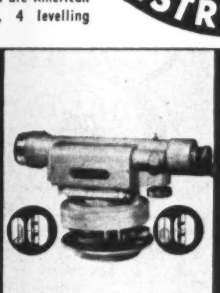

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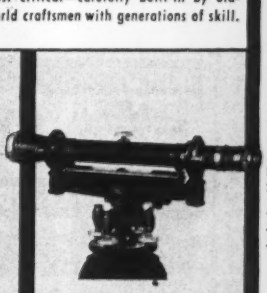

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Richmond:....W. F. Hobart, 805 E. Franklin St.
Savannah: Andrew Bunn Co., 140 Abercorn St.
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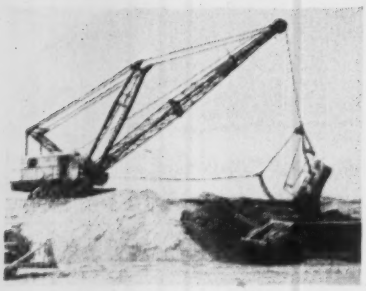

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C-18

mains, $868,000; Job 5, 1 m. g. elevated steel water storage tank, $207,000. Freese & Nichols, 407 Danciger Bldg., Fort Worth, consult. engrs. CD 9/12/52.

Va., Bedford—Town, Town Hall, WW imprvs. $600,000. Wiley & Wilson, Peoples Nat'l Bank Bldg., Lynchburg, consult. engrs. CD 3/19.

SEWERS, WASTE DISPOSAL

▲ Fla., Miami—City, City Hall, bond election Nov. 24, storm sewer imprvs. $2,500,000.

Fla., Tampa—City, City Hall, sanitary sewers for newly annexed areas of city. Over $500,000. Greeley & Hansen, 220 S. State St., Chicago, Ill., consult. engrs.

Ill., Deerfield—Village, Village Hall, rehabilitate sewerage system. $570,000.

▲ Minn., Richfield (Minneapolis P.O.)—Village, P. H. Haugen, clk., Richfield, lateral sanitary and storm sewers in 1954. $1,000,000. G. M. Orr Engr. Co., 1004 Marquette Ave., Minneapolis, consult. engr.

▲ N. J., New Brunswick—Middlesex County Sewerage Auth., New Brunswick, Raritan Valley Trunk Sewerage System have entered into design and supervision contracts as follows:

Metcalf & Eddy, 1300 Statler Bldg., Boston, Mass., will be supervising engineers and will design the treatment plant and 2 mi. outfall into Raritan Bay.

Charles J. Kupper, 15 Stelton Rd., New Market, N. J., will design main trunk sewer from Bound Brook to pumping station at confluence of South River and Raritan.

Elson T. Killam, 529 Milburn Ave., Short Hills, N. J., will design force main extending from pumping station to treatment plant at Sayreville.

Bogert-Childs Engineering Assocs., 624 Madison Ave., New York, N. Y. will design South River Interceptor line. Total est. $22,500,000. CD 10/23/52.

▲ Pa., Upper Darby—Upper Darby Comrs., Upper Darby, incinerator. $1,900,000. CD 5/2/52.

Tex., Amarillo—City, c/o N. V. Moss, mgr., sewage treatment plant. $500,000. Freese & Nichols, 407 Danciger Bldg., Fort Worth, consult. engrs. CD 4/30/52.

BRIDGES

▲ Miss., Biloxi—Louisville & Nashville R.R. Co., L. L. Adams, ch. engr., 908 W. Broadway, Louisville, 1, Ky., railroad bridge over Pearl River. $1,250,000.

STREETS AND ROADS

▲ Fla., Miami—City, City Hall, bond election Nov. 24, street imprvs. $2,500,000. CD 11/8/44.

▲ MICHIGAN—Michigan Turnpike Auth., Lansing, Detroit-Bay City—rein.-con. toll road between Detroit and Bay City. $100,000,000, Coverdale & Colpitts, 120 Wall St., New York, N. Y., and J. E. Greiner Co., 1201 St. Paul St., Baltimore, Md., consult. engrs. preliminary studies.

Detroit—rein.-con. toll hy. and bridges between Detroit and Illinois State Line, $200,000,000, Edwards, Kelcey & Beck, 3 Williams St., Newark 2, N. Y., consult. engrs. preliminary studies.

▲ PENNSYLVANIA—Pennsylvania Turnpike Comn., Harrisburg,

125 mi. Northeastern extens. Pennsylvania Turnpike from Phila. to near Binghamton, N. Y. Tentative route is from Delaware River Ext. near Phila., north to Allentown-Bethlehem-Easton Ext., northwest to Wilkes-Barre-Scranton region and north to New York State line. $250,000,000.

Ont., Welland—Welland County Council, Welland, 21.6 mi. highway between Welland and Port Colborne from new Prince Charles Dr. $700,000. C. A. Poynton, c/o owner, engr. and road supt. CD 2/18/47.

AIRPORTS

† Miss., Gulfport—TRAINING CENTER—U. S. Eng., P. O. Box 1169, 2301 Grant St., Mobile 7, Ala., plans by H. D. Shaw & Assoc., M. Salloun Bldg., barracks, mess hall, service shop, dispensary, etc. Air National Guard Training Center. $750,000.

PUBLIC BUILDINGS

▲ Calif., South San Francisco—CLASSROOMS—South San Francisco Elementary School Dist., South San Francisco, $1,250,000 bond election Jan. 14, addnl. classrooms.

▲ Conn., Hartford—OFFICE—State of Connecticut, Ralph G. Macy, comr. P. Wks., State Office Bldg., plans by Douglas Orr, 111 Whitney Ave., New Haven, office bldg. $3,800,000. CD 3/16/49.

▲ Del., Newark—HIGH SCHOOL, etc.—Newark Bd. Educ., Newark, high school, $2,000,000; Brookside elementary school, $300,000.

Del., New Castle—ELEMENTARY SCHOOL—Rosehill-Minquadale School District, New Castle, elementary school. $700,000.

▲ Fla., Clearwater—SCHOOLS—Pinellas Co. Bd. P. Instruction, 305 Haven St., Pinellas Park Junior High School, $500,000; Tyron Gardens Junior High School, $500,000; Southeast Senior High School, $750,000; Northeast Junior High School, $500,000; Northwest Senior High School, $750,000; Largo Junior High School addn., $400,000; Pasadena Elementary School, $300,000; Jordan Elementary School, $300,000;

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C-17

Welch Causeway Elementary School, $300,000, all St. Petersburg; Junior High School, Dunedin, $500,000.

▲ Fla., Miami—CITY HALL—City, City Hall, bond election Nov. 24, city hall. $4,250,000. CD 11/11/52.

Fla., Miami—POLICE HEADQUARTERS—City, City Hall, bond election Nov. 24, police headquarters. $750,000. CD 9/28/51.

Fla., Ocala—PRISON—Florida State Improvement Comn., Caldwell Bldg., Tallahassee, plans by James Gamble Rogers II, 145 Lincoln Ave., Winter Park, State Women's Prison. $900,000. CD 6/24.

▲ Ill., Centreville Twp. (East St. Louis P.O.)—HOSPITAL—Centreville Township Hospital, Francis Touchette, superv., Church Lane, Centreville Twp., East St. Louis, voted $2,500,000 bonds, cross-shaped-air-conditioned hospital. Charles B. Spencer, Joseph D. Standish Assoc., 404 Chemical Bldg., 271 Olive St., St. Louis 1, Mo., archts. CD 10/5.

Kan., Independence—COURT HOUSE ANNEX—Jackson Co. plans by Gentry & Voskamp, 4 W. 13 St., Kansas City, Mo., court house annex, $750,000.

▲ Kan., Kansas City—SCHOOL—Bd. Educ., Library Bldg., voted $6,500,000 bonds Oct. 20, school imprvs. CD 9/16.

▲ Me., Augusta—OFFICE—State, Dpt. P. Bldgs., State House, plans by Miller & Beal, Inc., 465 Congress St., Portland, state office, Grove, Capitol and Jackson Sts. $3,000,000. Desmond & Lord, 6 Beacon St., Boston, Mass., assoc. archts. Fels Co., 42 Union St., Portland, heating engr. CD 6/9/49.

Mich., Clio—SCHOOL—Bd. Educ., $600,000 bond election Dec. 15, brick, steel high school.

▲ Mich., Niles—SCHOOL—City, Bd. Educ., Niles, plans by Eberle M. Smith Assoc., Inc., 153 E. Elizabeth St., Detroit, 2 story, brick, steel high school. $1,000,000. CD 10/20.

▲ Minn., Austin—SCHOOL—Bd. Educ., S. L. Coumbe, clk., plans by Toltz, King & Day, 1509 Pioneer Bldg., St. Paul, grade school, 2 school addns. $1,000,000. CD 12/20/51.

▲ Minn., Brainerd—SCHOOL—Bd. Educ., H. C. Nordgaard, supt., $1,950,000 bond election Nov. 10, 3 grade schools, Junior High School addn. H. H. Swanson, 500 Sexton Bldg., Minneapolis, archt.

▲ Minn., Robbinsdale—SCHOOL—Bd. Educ., Dr. F. Hosterman, chn., $3,200,000 bond election Nov. 17, new high school in Robbinsdale, $2,450,000; grade school in Golden Valley, $750,000. CD 2/4.

▲ Minn., St. Louis Park—SCHOOLS—Bd. Educ., H. Erestvedt, supt. Schools, $4,200,000 bond election Nov. 23. Senior High School, $3,000,000 grade school, $1,000,000. CD 8/18.

▲ Minn., St. Peter—SCHOOL—Bd. Educ., W. H. McKenzie, clk., voted $1,350,000 bonds Oct. 21, high school, H. H. Swanson, 500 Sexton Bldg., Minneapolis, archt. CD 3/2.

▲ Miss., Jackson—SCHOOL—City, School Bd., voted $3,000,000 bonds Oct. 7, school imprvs. CD 9/3/52.

▲ Mo., Maplewood—SCHOOLS—Maplewood-Richmond Heights School Dist., 7539 Manchester Rd., Zone 17, voted $1,800,000 bonds Oct. 27, schools. CD 10/20.

Pa., Levittown—SCHOOLS—Levittown Educational Foundation, c/o Levitt & Sons, Admin. Bldg., Levittown, two 20 room schools for Levittown Community, for Bristol Twp. School Dist. $800,000.

▲ Pa., Phila.—MUNICIPAL—Phila. Dpt. Procurement, City Hall Annex, plans by Harbeson, Hough, Livingston & Larson, 117 S. 17 St., Reyburn Plaza Municipal Bldg. and parking area, $8,000,000. CD 7/20.

▲ Pa., Quakertown—HIGH SCHOOL—Quakertown-Tohickon Twp. School Bd., Quakertown, plans by H. F. Everett & Assocs., Commonwealth Bldg., Allentown, high school. $1,250,000. CD 8/6.

R. I., Lincoln—HIGH SCHOOL—Town, Vincent Nevins, supt. Schools, Lonsdale, plans by Haldeman & Jacoby, 153 Main St., Brockton, Mass., cinder block faced with brick Junior High School, Soares Property, near George Washington Hy. $610,200.

Tenn., Memphis—LIBRARY—City, City Hall, plans by Robert L. Hall, 212 Adams St., main library. $750,000. CD 9/2/52.

† Va., Quantico—ADMINISTRATION—P. Wks. Office, Dpt. Navy, Wash., D. C., plans by Marcellus Wright & Son, 100 E. Main St., Richmond, admin. bldg., Marine Corps School. $900,000.

▲ Wyo., Casper—COLLEGE, etc.—Natrona County High School District, High School Bldg., voted $2,300,000 bonds, Junior High School, $1,150,000; Junior College addn., $800,000; elementary schools addns., at Casper and Midwest. CD 9/29.

▲ Ont., London—HOUSING—Central Mortgage & Housing Corp., 343 Richmond St., 250 houses, shopping center, school, etc. on former Fairmont golf course, southeast of here, $3,000,000. R. P. Opie, c/o owner, engr. CD 6/10/48.

Sask., Moose Jaw—SCHOOL BUILDINGS—Dpt. Public Health, Parliament Bldgs., Regina, plans by H. K. Black, Black Block, Moose Jaw, 6 buildings for training school for Saskatchewan Mental Health School. $950,000. CD 4/2/52.

▲ Sask., Regina—LIBRARY—Regina College, University of Saskatchewan, Regina, plans by H. K. Black, Black Block, Moose Jaw, library for Regina College. $1,250,000.

COMMERCIAL BUILDINGS

▲ Calif., Garden Grove—DWELLINGS—Netherby Constr. Co., Box 217, Garden Grove, 127 dwellings at Katella and West Sts., Chapman and Magnolia Sts. $1,000,000.

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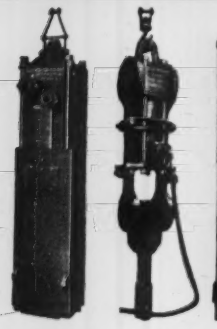

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▲ **Calif., Stockton**—MEDICAL CENTER—Stockton Medical Center, Inc., P.O. Box 1287, medical center. $1,500,000. George Dickey, c/o owner, consult. structural engr.

▲ **Conn., Stamford**—CHURCH, etc.—First Presbyterian Church, c/o Sherwood Mills & Smith, 65 Broad St., Stamford, and Harrison & Abramowitz, 45 Rockefeller Plaza, New York, N. Y., church and educational bldg. $1,000,000. CD 7/13.

▲ **D. C., Wash.**—LIBRARY, etc.—Georgetown University, 37 and O Sts. N.W., Wash., D. C., library, $2,300,000; law center, $1,900,000. CD 5/21; School of Foreign Service, $1,500,000; Science Bldg., $1,350,000; Graduate School, $1,350,000; dining hall, $1,000,000; hospital wing, $975,000; medical-dental school wing, $800,000; languages and linguistics bldg., $750,000.

Fla., Coral Gables—DEPARTMENT STORE—Sears, Roebuck & Co., 675 Ponce De Leon Dr., Atlanta, Ga., plans by Weed-Russell-Johnson Assocs., 550 Brickell Ave., Miami, retail department store, $500,000.

Ga., Atlanta—OFFICE—Stanley Kallin, 35 Lombardy Ave. N.E., office. $750,000.

Ill., Chicago—GYMNASIUM, etc.—Angel Guardian Parish, 2001 S. Devon St., plans by Gaul & Voosen, 228 E. Superior St., Zone 11, orphanage gymnasium and swimming pool. $500,000.

▲ **Ill., Chicago**—HOTEL—Avis Rent-A-Car System, 5893 S. Cicero St., deluxe hotel adjoining 5893 S. Cicero Ave. $1,000,000.

▲ **Ill., Chicago**—AUDITORIUM, etc.—De Paul University 2235 N. Sheffield St., auditorium with swimming pool, Belden, Webster, Kenmore and Sheffield Aves., 3 story science research bldg., Kenmore and Belden Aves.; 4 story annex to Liberal Arts bldg. at Uptown Campus; 3 story library, Belden Ave., Seminary and Kenmore Sts. Downtown Campus, 64 E. Lake St. $5,500,000.

▲ **Ill., Chicago**—HIGH SCHOOL—Sienna High School, 5618 W. Washington St., plans by Belli & Belli, 8 S. Dearborn St., Zone 3, 4 story, bsmnt., high school. $1,500,000.

▲ **Ill., Evanston**—MEMORIAL, etc.—Northwestern University, 607 Clark St., plans by Holabird, Root & Burgee, 180 N. Wabash St., Chicago, Zone 1, 4 story Dwight St. John Bobb Memorial Bldg., $1,000,000; McCulloch Memorial Bldg., $1,000,000.

▲ **Ind., Fort Wayne**—COLLEGE—Concordia College Bd. Control, Concordia Pl., plans by Eero Saarinen & Assocs., Bloomfield Hills, Mich., college program $5,000,000. CD 5/15/47.

▲ **Kan., Wichita**—SHOPPING CENTER—Builders, Inc., Lincoln and Oliver Sts., plans by George Metz, 108 S. Green St., shopping center, $1,000,000.

Mass., Brighton-Newton—HOUSING—Berry Corporation, c/o Samuel Glaser Assoc., 105 Newbury St., Boston, 50 residences Brayton Rd. and Kendrick St. $500,000.

Mich., Ann Arbor—SCHOOL—St. Thomas the Apostle Parish, Ann Arbor, plans by Walter J. Rozyckl, 2266 E. Forest St., 2 story, brick, steel high school addn. $500,000.

Mich., Niles—HOSPITAL—Pawating Hospital, Henry W. Zimmer, Bd. Trustees, Niles, plans by Lewis J. Sarvis, 258 Champion St., Battle Creek, brick, steel hospital addn. $600,000. CD 9/18/51.

N. J., Moorestown—RESIDENTIAL DEVELOPMENT—Collins Realty Co., 527 Welsh St., Chester, Pa., residential development, $500,000.

▲ **N. M., Albuquerque**—HOTEL, etc.—Homer Maxey & Assocs., Plainsman Hotel, 1611 Fourth St., Lubhock, Tex., plans by Charles E. Armstrong, First Life Bldg., Fort Worth, Tex., 7 story, 300x300 ft. hotel, air-conditioning, $2,250,000; rein.-con. swimming outdoor pool, $75,000; 500-auto parking proj. $200,000. Leonard E. Kanto, N. P. Anderson Bldg., Fort Worth, Tex., consult. engr. CD 11/17.

▲ **N. Y., New York**—SHOPPING CENTER, etc.—East River Housing Corp., 550 Grand St., Zone 2, plans by George S. Springsteen, 92 Liberty St., Zone 6, shopping center, stores and offices, 539-71 Grand St., $660,000; heating plant, 325 Delancey St., $175,000; garage, 305 Delancey St., $265,000.

▲ **O., Cleveland**—HOSPITAL—Cleveland Clinic Foundation, 2020 E. 93 St., Zone 6, plans by Ellerbe & Co., E505 First Natl. Bank Bldg., St. Paul, Minn., 8 story, 220-bed addn. at Cleveland Clinic Hospital, incl. 22-operating rooms, other facilities. $4,000,000.

Okla., McAlester—EDUCATIONAL, ETC.—First Baptist Church, McAlester, plans by Noftsger & Lawrence, 2756 N. W. 23 St., Oklahoma City, 5 story educational bldg. annex, rebuild sanctuary and addnl. remodeling, etc. $555,000.

▲ **Pa., Elkins Park**—SYNAGOGUE—Reform Congregation Keneseth Israel, 1723 N. Broad St., Phila., plans by I. Demchick, 246 S. 15 St., Phila., synagogue and parking area. $1,250,000.

▲ **Pa., Phila.**—STORE—Lord & Taylor Div. of Associated Drygoods Corp., 366 Fifth Ave., New York, N. Y., plans by Fordyce & Hamby, 70 W. 40 St., New York, N. Y. department store, Belmont Ave. and City Line. Approx. $1,000,000. Raymond Loewy, 488 Madison Ave., New York, N. Y., designer.

▲ **Tenn., Memphis**—APARTMENT—George Harsh, Jr., Commerce Title Bldg., plans by Faires & Sanford, Falls Bldg., apartment. $5,000,000. CD 8/11.

Tex., Houston—SANCTUARY—Congregation Beth Yeshurun, 3501 Southmore Ave., plans by Finger & Rustay, 711 C & I Bldg., masonry sanctuary addn. $750,000.

▲ **Tex., San Antonio**—SHOPPING CENTER—Community Realty Co. & Handy-Andy Co., 3022 E. Houston St., plans by Reginald Roberts Assocs., proj. archts., 2600 N. McCullough St., 120,000 sq. ft. brick, steel regional shopping center, 40-acre tract, Austin Hy. and Military Dr. $1,700,000.

▲ **Utah, Salt Lake City**—BANK—First Security Bank, 4th South and Main Sts., plans by Slack W. Winburn, Beason Bldg., bank. $3,000,000.

▲ **Wash., Spokane**—HOSPITAL—Deaconess Hospital, 733 4 St., plans by Fugart, Burt, Wilkinson & Orth, 520 N. Michigan Ave., Chicago, Ill., 4 and 6 story hospital addns. $1,000,000. CD 7/5/51, under LB.

▲ **Ont., London**—OFFICE, etc.—W. E. Mara, 1006 Maitland St., 3 story, 84,000 sq. ft., brick, steel, concrete office building, incl. stores, and car parking space. $1,500,000.

▲ **Ont., Ottawa**—HOUSING—Westwood Lands Ltd., 216 Laurier Ave. W., plans by Abra, Balharrie & Shore, 55 Metcalfe St., 249-unit housing development, Carling-Woodroffe, 9 Ave. and Richmond Rd. $3,500,000.

▲ **Ont., Ottawa**—APARTMENT DEVELOPMENT—Woodroffe Investments Ltd., 216 Laurier Ave. W., plans by Abra, Balharrie & Shore, 55 Metcalfe St., apartment development, Carling-Woodroffe-9 Ave. and Richmond Rd. $5,500,000.

▲ **Ont., Toronto**—APARTMENT BLOCK—Empire Construction Co., York Downs Rd., plans by E. I. Richmond, 455 Spadina Ave., 228-suite, 3 story, bsmnt., 56x118 ft., concrete, brick APARTMENT block Bathurst St. near Wilson Ave. $1,500,000.

▲ **Ont., Toronto**—APARTMENT BLOCK—Midtown Construction Co., 1006 Pharmacy Ave., plans by E. I. Richmond, 455 Spadina Ave., five 3 story, bsmnt., 56x134 ft., 133-suite concrete, brick apartment block, Pharmacy Ave. $1,000,000.

Ont., Toronto—TRAINING SCHOOL—United Church of Canada, 269 W. Queens St., plans by A. H. Eadie, 220 W. Bloor St., 4 story, bsmnt., 63x154 ft. concrete, brick, stone training school, Victoria Campus. $600,000. Wallace & Assocs., 35 Isabella St., consult. engrs. CD 12/20/51.

INDUSTRIAL BUILDINGS

▲ **Fla., Tampa**—POWER PLANT—Tampa Electric Co., Cass and Tampa Sts. Power Plant No. 3, at Hooker's Point. Over $1,000,000.

▲ **Neb., Lincoln**—GRAIN ELEVATOR—Equity Union Grain Co., 940 Calvert St., grain elevator addn. $1,000,000.

Neb., Lincoln—GRAIN ELEVATOR—Gooch Milling Co., 540 South St., grain elevator addn. $800,000. CD 8/3/51.

▲ **O., Massillon**—MILL—Republic Steel Corp., Republic Bldg., Cleveland, Zone 13, cold rolling mill for cold reduction of stainless steel coils; 26 ft. two high temper mill; process finishing maintenance, handling equip. and overhead cranes. E. W. Phillips, ch. engr. Central Alloy Dist., Republic Steel Corp., Massillon.

▲ **O., Solon Village**—PLANT—Goff-Kirby Co., Fidelity Bldg., 1940 E. 6 St., Cleveland, Zone 14, ready mix cement plant. $2,000,000.

▲ **S. C., Charleston**—PASSENGER STATION, etc.—Southern Ry. System, J. B. Akers, ch. engr., P.O. Box 1808, Wash. 13, D. C., passenger station and freight terminal. $1,000,000.

▲ **Tex., Arlington**—PLANT—Chrysler Corp., 341 Massachusetts St., Detroit, Mich., auto mfg. plant.

▲ **Sask., Prince Albert**—BREWERY EXPANSION—Sick's Prince Albert Brewery Ltd., 6 Ave. and 17 St., brewery expansion. $1,250,000.

UNCLASSIFIED

Colorado—TRANSMISSION LINE, etc.—Western Colorado Power Co., Montrose, transmission line and substations Montrose and Telluride, $500,000. Miner & Miner, 905 16 St., Greeley, consult. engrs. and archts.

▲ **Fla., Tallahassee**—ELECTRIC DISTRIBUTION SYSTEM, etc.—City, City Hall, bond election Dec. 8, electric distr. sys. and street lighting. $1,500,000. CD 6/9.

Iowa—RURAL DISTRIBUTION LINES—Winnebago Electric Co-operative, Thompson, rural distr. lines and sys. imprvs., Winnebago Co. $500,000. E. G. Skarshoug, Ames, consult. engr. CD 2/3/49.

Louisiana—OIL LINE—Gulf Refining Co., Gulf Bldg., Houston, Tex., 55 mi. 12 in. crude oil line between Plaquemines and Bay Marchand. $685,000.

▲ **Montana, South Dakota, North Dakota**—PIPE LINE Williston Pipeline, Inc., Billings, Mont., 8 in. oil pipe line from Billings-Laurel refining area to Glendive, Mont., and western part of North and South Dakota. $7,000,000. Ebasco Services, Inc., 2 Rector St., New York, N. Y. consult. engrs., will make economic study.

▲ **Oklahoma**—PIPE LINE, etc.—Sinclair Pipe Line Co., 2119 Lofland St., Dallas, Tex., pipe line in areas between Panova and Cushing, $1,566,500; oil products storage, at Panova, $178,000; some crude pipe line north of Pauls Valley, $375,000. CD 1/11/51.

▲ **Pa., Phila.**—TELEVISION TRANSMITTER—Daily News Television Corp., 1425 Walnut St., plans by William T. Meyer, 515 Madison Ave., New York, N. Y., UHF television transmitter. $1,000,000. CD 8/28/52.

Texas—RURAL DISTRIBUTION LINES—Karnes Electric Co-operative, Karnes City, rural distr. lines and sys. imprvs., Karnes City area, Karnes Co. $630,000. CD 1/16/52.

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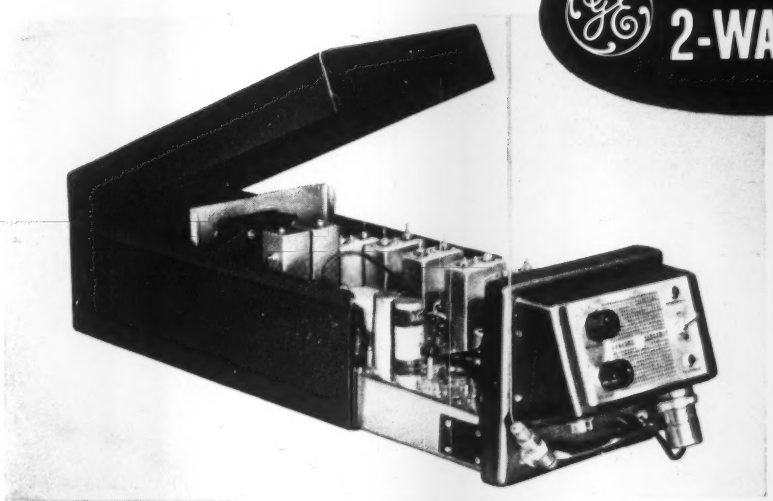

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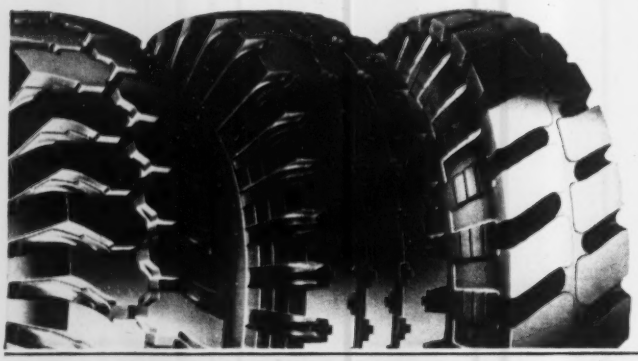

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Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
November 17 Massachusetts
STREETS AND ROADS
November 17, December 1 Massachusetts

BUILDINGS

LOW BIDS AND CONTRACTS

▲ Concrete Constr. Co., 11 Garfield Ave., Chelsea, Mass. LB $1,686,745. HIGH SCHOOL, easterly side of Broadway, SAUGUS, MASS. Town, W. E. Lawrence, town mgr., Town Hall, Saugus, Mass. Bids Oct. 30. CD 9/29.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
November 19, New Jersey, Pennsylvania
November 20 Pennsylvania
STREETS AND ROADS
November 17 Maryland November 19 New Jersey
November 19, 20 Pennsylvania

BIDS ASKED—BUILDINGS

▲ Pa., Phila.—BASIC SCIENCE—B.A. 11/17—Drexel Institute of Technology, 32 and Chestnut Sts., (selected list of bidders) basic science bldg. $1,479,590. Baader, Young & Schultze, 1500 Walnut St., archts. Chester I. Duncan, Lewis Tower Bldg., engr. CD 2/7/52.

SOON LETS CONTRACT—BUILDINGS

▲ N. J., Camden—PLANTS—R.C.A. Victor Div., Radio Corp. of America, Front and Cooper Sts., soon lets contract, five plant buildings in Delaware Township. $5,000,000. Severud-Elstad-Krueger, 415 Lexington Ave., New York, N. Y., engrs. Vincent G. Kling, 917 Corinthian Ave., Phila., Pa., archt. CD 3/12.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ NEW YORK—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany,
The Westcott Constr. Co., 52 N.Washington St., North Attleboro, Mass., CA $990,708, grading, paving and foundation;
Phoenix Bridge Co., Bridge St., Phoenixville, Pa., CA $1,458,215, steel superstructure for constr. of 6 span 776 ft. Thruway viaduct over New York Central's tracks, near Herkimer, Herkimer Co. Bids Sept. 10. CD 9/14, under LB.

▲ NEW YORK—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany,
Lizza & Sons, Inc., 21 Orchard St., Oyster Bay, N. Y. CA $927,483, est. $1,120,000, Hauppauge-Nesconset Co. Rd. 85, 4.69 mi. FASS 53-12, Suffolk Co.;
Torrington Constr. Co., Inc., Torrington, Conn., CA $1,845,371, est. $1,854,000, Speculator-Indian Lake, Pt. 1, 10.66 mi. FAS. SH 53-11, Hamilton Co. Bids Sept. 3. CD 9/9, under LB.

▲ NEW YORK—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany,
Mt. Vernon Constr. Corp., S. A. Healy Co., M. A. Gammino Constr. Co., 439 N. Terrace Ave., Mt. Vernon, N. Y., CA $10,044,782, est. $10,046,000, c. conc. 4.64 mi. unrein.-con. 2.56 mi. b. conc. 0.23 mi. misc. work, 0.08 mi. 4 hy. seps. comp. I-beams 161.1 ft., 58 ft., 218.8 ft., and 125 ft. hy. sep. I-beam, 246.8 ft. bridge built-up beam 462.5 ft. railroad and hy. sep. div. comp. I-beam 788 ft. Ped. br. comp. I-beam 149.5 ft. New York State Thruway-Catskill Sect. Sub. 7 (Suffern-Harriman Pt. 2), Rte. 17, Interchange 4 misc. sec. roads, New Jersey State Line-Ramapo. S.H. 1844 CT 53-12, RC 53-107, ST 53-31, Rockland Co. Bids Sept. 17. CD 9/21, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ Lake Isle Homes, c/o Gustave W. Iser, archt., 95 Madison Ave., New York 16, N. Y. Owner Builds. $2,000,000 65 HOUSES, 80-acre tract, EASTCHESTER, N. Y.

▲ Merritt & Holby, 4 Chatsworth Ave., Larchmont, N. Y. Owner Builds. $1,500,000. 90 HOUSES 27-acre tract, King St., PORT CHESTER, N. Y. C. C. Merritt, c/o owner, archt.

▲ Fox Bros., Washington Lane and Township Line Rd., Jenkintown, Pa., CA $1,537,000, APARTMENT, Washington Lane and Township Line Rd., JENKINTOWN, PA. The Benson Apartment Corp., c/o general contractor, George S. Idell, 117 S. 17 St., Phila., Pa., archt.

▲ Pennsylvania Builders, Inc., Gay and Anderson Sts., Phoenixville, Pa. Separate Contracts, $2,000,000. RESIDENTIAL DEVELOPMENT, Pennypacker Gardens, PHILA., PA.

▲ Ralph Bodek, 160 Long Lane, Upper Darby, Pa., Separate Contracts, $1,500,000. RESIDENTIAL DEVELOPMENT, Baltimore Ave. in Sproul Rd., SPRINGFIELD, PA.

▲ George W. Jeffery & Ralph Robinson, 2201 Parkway, Phila., Pa., Separate Contracts, $2,250,000. RESIDENTIAL DEVELOPMENT, Old York Rd., WILLOW GROVE, PA.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
November 18 Louisiana
STREETS AND ROADS
November 19 Virginia

BIDS ASKED—BUILDINGS

▲ Va., Norfolk—SCHOOL—B.A. 11/19—City School Bd., Bank and Charlotte Sts., 1 story masonry Thole Street School. $1,000,000. Oliver & Smith, 409 Yarmouth St., archts. Fraioli-Blum-Yesselman, 1214 Granby St., engrs. CD 6/30.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
November 17 Illinois, Indiana November 24 Wisconsin
STREETS AND ROADS
November 17 Illinois, Indiana November 24 Wisconsin

BIDS ASKED—BUILDINGS

▲ Mich., Roseville—SHOPPING CENTER—Bids Asked—Eastgate Shopping Center, Inc., Gratiot and Frazho Sts., (selected list bidders), shopping center incl. stores and parking area, 100 acres, Gratiot and Frazho Sts. $4,000,000. Charles N. Agree, Inc., 1140 Book Bldg., Detroit, archt. CD 9/8/52, under Mich., Detroit.

▲ Mich., Southfield—SHOPPING CENTER—Bids Asked—Northland Center, J. L. Hudson Co., 1206 Woodward Ave., Detroit, shopping center, incl. 70 stores, Nine Mile Rd. and Greenfield St. Total est. cost $20,000,000. Crane Kiehler & Kellogg, 112 Madison Ave., Detroit, archts. Victor D. Gruen Assoc., 1903 Industrial Bldg., Detroit, engrs.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ OHIO—Ohio Turnpike Comn., 139 E. Gay St., Columbus,
W. L. Johnson Constr. Co., Shook Rd., Groveport, O. LB $7,102,409. 8.1 mi. roadway, Constr. Sects. 36 and 37, Sandusky Co. Bids Oct. 29. CD 10/1.

† George W. Timmons, 780 W. Lane Ave., Columbus 12, O. LB $987,039, est. $1,142,708, propeller control and fatigue research bldg., Serial No. ENG-15-029-54-11, Wright Patterson Air Force Base, DAYTON, O. U.S. Eng., 830 W. Broadway, Louisville 3, Ky. Bids Oct. 29. CD 10/5.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ Scholz Homes, Inc., 3128 Lincolnshire St. W., Toledo, O. Owner Builds. $4,000,000. 165-California type frame HOMES, 90-acre tract bounded by Hillard Rd. on south and Detroit Rd. on north, ROCKY RIVER, O.

▲ Sumner S. Sollitt Constr. Co., 307 N. Michigan Ave., Chicago, Ill., CA, $4,543,000 five 471-unit APARTMENTS, 2nd phase of Harold L. Ickis Homes, 22 and State Sts., CHICAGO, ILL. Chicago Housing Auth. 608 S. Dearborn St., Chicago 5, Ill. Bids Oct. 6. CD 10/13 under LB.

▲ Ragner Benson, 4744 W. Rice St., Chicago 51, Ill., LB, $1,992,994, 2 story, brick HIGH SCHOOL, WHEATON, ILL. School District 95, 504 Naperville Rd., Wheaton, Ill. Bids Oct. 29. CD 10/13.

▲ O. W. Burke Co., 1032 Fisher Bldg., Detroit, Mich. CA Est. $1,800,000. 2 story, brick, steel SCHOOL, Cook Rd. at Mack St., GROSSE POINTE, MICH. Detroit University and Grosse Pointe Day Schools, Grosse Pointe, Mich. Bids Oct. 20. CD 10/8.

▲ Miller-Davis Co., 1029 Portage St., Kalamazoo, Mich. CA Est. $2,800,000. 450,000 sq. ft. aluminum, steel, glass, cement and cinder block CONVERTING PLANT, PORTAGE, MICH. Sutherland Paper Co., William Race, pres., Portage, Mich.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
November 17 Iowa November 20 Minnesota
November 24 Missouri, Montana, Texas
November 25 Texas
STREETS AND ROADS
November 17 Iowa November 20 Minnesota
November 24 Missouri, Montana, Texas
November 25 Texas

BIDS ASKED—BUILDINGS

▲ Tex., Dallas—LIBRARY—B.A. 11/23—City, City Hall, Main and Harwood Sts., public library. $1,500,000. George L. Dahl, 2101 N. St. Paul St., archt. CD 10/23.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

▲† Oregon—B.A. About 12/22—U. S. Eng., Pittock Block, Portland, Zone 5, complete excav. for and constr. substructure for main unit bays 15 to 22 of power house; excav. and constr. east fish ladder and east concrete non-overflow dam; furnish, install wires and gates in power house fish collection sys., The Dalles Damsite, Civeng-35-026-54-54. $20,000,000.

BIDS ASKED—BUILDINGS

Calif., Los Angeles—SCHOOL—B.A. 12/2—Los Angeles Bd. Educ., 1425 S. San Pedro St., Los Angeles, rein.-con. Pacoima Junior High School, $1,850,000. Wm. Glenn Balch & L. L. Bryan, 2933 Rowena Ave., Zone 9, archts. CD 11/3/52.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ English Electric Export & Trading Co. Ltd., 23 Beaver St., New York, N. Y., LB $3,651,476, two 73,684-kv. main unit Generators Nos. 13 and 14, McNary Dam, Umatilla Co., Civeng-45-164-54-17, OREGON. U. S. Eng., City-County Airport, Walla Walla, Wash. Bids Oct. 27. CD 9/23.

▲ CALIFORNIA—State Div. Hys., P. Wks. Bldg., Sacramento,
Peter Kiewit Sons' Co., 442 Post St., San Francisco, Calif., LB, $4,387,474, grading, paving, traffic separation structures 3 mi. between Ashby Ave. and El Cerrito Overhead, Alameda Co.;
Joe Vicini, P. O. Box 206, Placerville, Calif., LB, $72,708, grading, surf. 2.7 mi. Calaveras Co.;
Eugene G. Alves Constr. Co., P. O. Box 950, Pittsburg, Calif., LB, $308,358, grading, surf. 2.6 mi. Alhambra Ave. exten. and Pleasant Hill Rd., Contra Costa Co.;
Arthur B. Siri, Inc., 1357 Cleveland Ave., Santa Rosa, Calif., LB, $65,349, grading, surf. 1.7 mi. Old Sonoma Rd., Napa Co.;
W. F. Maxwell, 634 S. Western Ave., Los Angeles, Calif., LB, $142,521, grading, surf., bridges 0.4 mi. across Kaweah River, Tulare Co.;
Harms Bros., 5261 Stockton Blvd., Sacramento, Calif., LB, $491,161, grading, surf. 4.7 mi. Secret Valley Lassen Co. Bids Oct. 28. CD 10/6.

▲† C. H. Leavell & Co., 1900 Wyoming St., El Paso, Tex., CA, $1,625,574, addnl. field training facilities NOY 76752, Spec. 37403, CAMP PENDLETON, CALIF. Dpt. Navy, P. Wks. Office, San Diego, Calif. Bids Oct. 20. CD 10/28, under LB.

▲ Arundel Corp. & L. E. Dixon, 409 S. California St., San Gabriel, Calif., LB, $3,167,709, La Cienega and San Fernando Valley Relief Sewer, Unit "B" Section 2, LOS ANGELES, CALIF. City, City Hall, Los Angeles, Calif. Bids Oct. 28. CD 9/24.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ H. B. Nicholson, 880 E. Colorado St., Pasadena, Calif., CA, $1,964,000, North Reseda Junior HIGH SCHOOL, LOS ANGELES, CALIF. Los Angeles Bd. Educ., 1425 S. San Pedro St., Los Angeles, Calif. Bids Oct. 22. CD 10/28, under LB.

▲ Richards Constr. Co., Box 1187, Studio City, Calif., CA, $3,188,000, Pacoima low-rent HOUSING, Pacoima, LOS ANGELES, CALIF. Housing Auth. of City of Los Angeles, 1401 E. First St., Los Angeles, Calif. Bids Sept. 29, awarded Oct. 27. CD 10/2, under LB.

▲ Haas & Haynie, 274 Brannan St., San Francisco, Calif., LB, $6,318,000, general contract Hillsdale SHOPPING CENTER and Macy's DEPARTMENT STORE, Hillsdale Development, SAN MATEO, CALIF. David G. Bohannon, 859 San Mateo Dr., San Mateo, Calif. Bids Oct. 28. CD 10/29.

CANADA

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
November 25 British Columbia

BIDS ASKED—BUILDINGS

▲ Que., Montreal—FILM BOARD—B.A. 12/16—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., national film board building. $5,500,000. Plans deposit $500. E. A. Gardner, c/o owner, archt. CD 4/17, under Que., St. Laurent.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ Dawson & Hall, 775 Clark Dr., Vancouver, B. C., CA, $3,912,431, hangar, COMOX, B. C. Govt. of Canada, Dpt. National Defence AIR, Ottawa, Ont. Defence Constr. Ltd., 56 Lyon St., Ottawa, Ont., engrs. CD 4/15.

▲ Bird Construction Ltd., 7 Erin St., Winnipeg, Man., CA, $3,484,019 cantilever hangar, WINNIPEG, MAN. Govt. of Canada, Dpt. National Defence, AIR, Ottawa, Ont. CD 9/24/52.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ Collet & Brothers Ltd., 978 Parthenais St., Montreal, Que., CA, $8,000,000, HOSPITAL addn., MONTREAL, QUE. Notre Dame Hospital Bd., 1560 Sherbrooke St. E., Montreal, Que. CD 9/10, under LB.

(Proposal Advertisements see pp. 95 to 97)

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WET JOBS

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West Milton, N. Y.

Excavation: Elmhurst Contracting Co.

QUAKY SOIL—fine alluvial silt overlying bedrock — was a hazard confronting General Electric and A.E.C. Vibration of excavating machinery made soil fluid, caused collapse of test hole.

A VACUUM WELLPOINT system, by Griffin, solved the rare type of problem involved. Removal of small amounts of water (only 20 gpm)—this plus high vacuum was enough to make soil stable—even to stand at slopes as steep as 1½ on 1 (See photo).

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Toronto Montreal Halifax

UNIT PRICES

River tunnel, New York

The main tunneling work on the third tube of the New York Port Authority's Lincoln Tunnel (ENR Oct. 22) will be handled by a combination of three contractors. The combination of Mason & Hanger; Arthur A. Johnson; and MacLean-Grove entered a $17,260,370 low bid.

Work includes constructing 6,258 ft of the 7,944-ft, two lane, tunnel plus related land work at each end of the New York-New Jersey tube. This includes 720-ft of hard-rock cutting under the Palisades.

Wage rates in the area include: bricklayers, $3.87 per hr; hoisting engineers, $3.69 per hr; and common laborers, $2.20 per hr.

Bidders include:

1C Mason & Hanger Co., Inc., Arthur A. Johnson Corp., & MacLean-Grove & Co., Inc., New York, New York $17,260,370
2 S. A. Healy Co., Long Island, City, N. Y. 20,301,932
3 Walsh Const. Co. & B. Perini & Sons, Inc., New York, New York 21,181,885

Bids: 10-14-53 Item	Unit	Quantity	Unit Prices 1C	2
Tunnel exc west of N. J.. ventilation shaft	lf	705	$2,000	$2,610
Tunnel exc wholly or partly in rock & partly in earth east of N. J. ventil shaft	lf	360	6,750	5,890
Tunnel exc wholly in earth east of N. J.. ventilation shaft	lf	5,040	825 00	1,442
Dredging	cy	41,000	1 80	1 20
Place clay blanket	cy	20,000	4 00	1 90
Cradle	lf	360	90 00	21 00
Erect CI & cast stl tunnel lining	ring	2,032	325 00	644 00
Perm tie-rod assemblies	ea	1,935	400 00	260 00
Grout & grav packing outside CI & cast stl tunnel lining	lf	400	160 00	329 00
Cradle	lf	702	160 00	184 00
Str stl tunnel lining	ring	145	15,000	7,040
Packing & grouting outside str stl tunnel lining	lf	702	150 00	43 00
Stl beams, cover plates & bearing plates in ventil shaft	lb	198,000	0 20	0 155
Steel drum in ventil shaft	lb	16,000	0 55	0 445
Tunnel roadway beams	lb	1,884,000	0 18	0 10
Tunnel ceiling angles & tees	lb	155,000	0 25	0 24
Tunnel roadway curbs	lf	12,400	5 50	5 80
Miscell str stl	lb	123,000	0 35	0 48
Reinforcing rods	lb	1,360,000	0 20	0 103
Wire mesh	lb	325,000	0 25	0 22
Iron castings	lb	35,000	0 35	0 42
Stl shackles for ceiling hanger supports	ea	508	25 00	18 00
Stl castings, excl of stl shackles for ceiling hanger supports	lb	9,800	0 45	0 42
Tunnel ceiling hangers	ea	600	35 00	31 00
Exhaust duct support hngr	ea	191	35 00	27 70
Copper drns & flashings	lb	800	2 00	2 10
Cement	bbl	81,000	4 50	4 40
Conc, other than tunnel concrete	cy	5,400	70 00	69 00
Tunnel concrete	cy	36,900	60 00	81 00
3" block protection	sy	1,700	5 70	11 55
12" concrete block	sf	280	3 50	2 10
8" concrete block	sf	1,400	3 00	1 70
Pneumatic mortar	sf	3,200	3 50	1 60
Cement plaster	sf	1,800	1 00	1 05
Porous conc pipe drains 12" diameter	lf	600	4 00	10 50
6" diameter	lf	705	7 00	4 20
Membrane wtrprfng, 4-ply	sy	2,500	2 50	20 00
Dampproofing	sy	1,100	1 10	2 00
Ceiling tile	sf	143,000	2 40	2 65
Fresh air flues	ea	826	60 00	60 00
Exhaust air ports type 6W	ea	160	65 00	65 00
type 6N	ea	120	60 00	57 00
type 4N	ea	50	55 00	46 50
type 3N	ea	130	45 00	40 00
type 2N	ea	180	35 00	30 00
Air measurement install	ea	12	1,500	280 00
Tunnel serv pipe, 8" dia	lf	6,200	15 00	16 00
Discharge pipe, 10" dia	lf	2,300	20 00	21 00
Brass pipe, 2½" dia	lf	3,600	9 00	9 45
Stl conduit, 1½" dia	lf	27,000	$2 45	$1 60
2"	lf	6,800	2 90	2 00
2½"	lf	20,000	3 75	2 90
3"	lf	100	5 50	4 00
3½"	lf	100	6 50	4 40
4"	lf	1,300	8 75	4 70
Silicon bronze conduit ¾" dia	lf	1,200	1 85	2 60
1" dia	lf	5,000	2 50	3 15
Asb cmt conduit, 3½" dia	lf	36,600	1 20	2 30
4" dia	lf	58,600	1 50	2 20
CI tunnel boxes, type O-16	ea	985	35 00	90 00
type O-13	ea	52	80 00	130 00
type O-14	ea	26	200 00	370 00
type O-15	ea	46	115 00	170 00

Culverts & bridges, Oklahoma

Sixteen bidders competed for a $177,788 bridge and culvert contract awarded by the Oklahoma State Highway Department, J. W. Klinglesmith, assistant federal aid engineer.

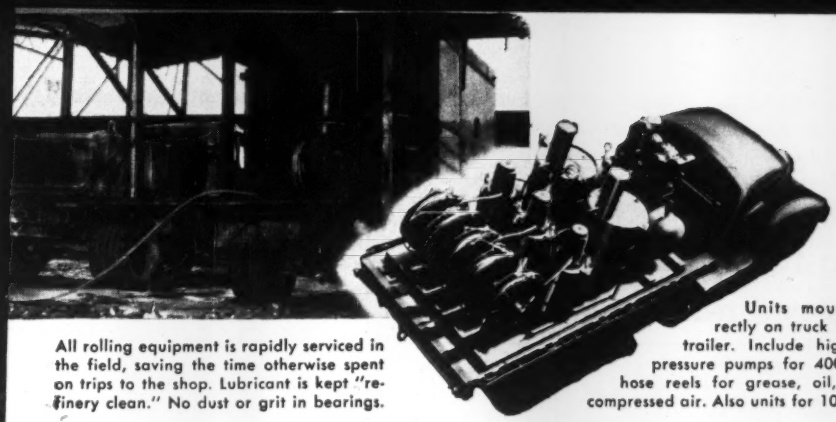
The work consists of grading, draining, and construction of five bridges (three concrete box culverts and two I-beam steel bridges). The two steel bridges have 52-ft high pile abutment foundation piers.

Minimum wage rates on the project are: skilled labor, $1.00 per hr; semi-skilled labor, $0.75 per hr; and common labor, $0.75 per hr.

Bidders include:

1C J. H. Barton Oklahoma City, Oklahoma $177,788
2 Gragg Const. Co., Henryetta, Oklahoma 179,973
18 A. K. McBridge, Ft. Smith, Arkansas 226,068

Bids: 8-4-53 Item	Unit	Quantity	Unit Prices 1C	2
Bridge no. 1				
Class D excavation	cy	900	$0 35	$0 35
Struct exc, uncl	cy	220	1 25	1 80
Class A concrete	cy	298 2	31 00	31 00
Reinf stl	lb	29,600	0 10	0 095
Bridge no. 2				
Class D uncl exc	cy	5,700	0 35	0 45
Substruct exc common	cy	880	4 50	7 00
Substruct exc rock	cy	35 6	11 00	20 00
Rem of existing struct	ea	1	500 00	700 00
RC handrail	lf	284 5	3 50	4 25
Structural steel	lb	107,870	0 125	0 115
Class A concrete	cy	172 9	38 00	44 00
Class A conc pier & abut bases	cy	104	42 00	44 00
Class AA concrete	cy	115 4	40 00	44 00
Reinforcing steel	lb	41,150	0 10	0 095
6" black traffic stripe	lf	181 3	0 30	0 03
Reinf conc piles	lf	684	8 00	6 80
Approach slab	sy	138	9 00	10 25
15" CGM pipe	lf	126	3 50	3 50
Inlet frame & grate	ea	4	75 00	80 00
Spec plain rip rap	t	1,200	3 50	3 30
4" sand cushion	sy	138	0 50	0 75
Bridge no. 3				
CI D uncl excavation	cy	800	0 35	0 15
Struct exc uncl	cy	200	1 25	2 60
RC handrail	lf	94 1	3 00	4 25
CI A concrete	cy	291 5	31 00	31 00
Reinf steel	lb	31,710	0 10	0 095
Bridge no. 4				
CI D uncl exc	cy	3,800	0 35	0 35
Substruct exc common	cy	915	5 50	5 00
Substruct exc rock	cy	85 5	11 00	20 00
RC handrail	lf	521	3 50	4 25
Structural steel	lb	219,440	0 125	0 115
Class A concrete	cy	259 4	38 00	44 00
CI A conc. pier & abut bases	cy	132 4	42 00	44 00
Class AA concrete	cy	207 5	40 00	44 00
Reinforcing steel	lb	65,440	0 10	0 095
6" black traffic stripe	lf	300 17	0 30	0 30
RC piles	lf	783	8 00	6 80
Approach slab	sy	138	9 00	10 25
15" CGM pipe	lf	122	3 50	3 50
Inlet frame & grate	ea	4	75 00	80 00
Spec plain rip rap	t	850	3 50	3 30
4" sandcushion	sy	138	0 50	0 75
Bridge no. 5				
Class D uncl excavation	cy	7,000	0 35	0 15
Struct exc uncl	cy	250	1 25	4 50
Class A concrete	cy	424 4	31 00	31 00
Reinforcing stl	lb	52,480	0 10	0 095



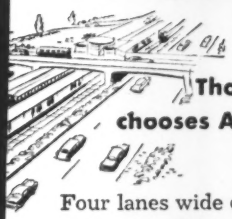
All rolling equipment is rapidly serviced in the field, saving the time otherwise spent on trips to the shop. Lubricant is kept "refinery clean." No dust or grit in bearings.

Units mount directly on truck bed or trailer. Include high and low pressure pumps for 400 lb. drums, hose reels for grease, oil, water and compressed air. Also units for 100 lb. drums.

Here a McQueen owned Alemite Portable Service Station is greasing a track roller on a bulldozer. Portable Service Stations bring on-the-spot lubrication to all equipment.

how Alemite *"Friction Fighters"* guard the machines...

DIGGING A BED FOR A $92,000,000 SUPER HIGHWAY



Thomas McQueen Company chooses Alemite portable service station for Chicago project

Four lanes wide each way, with room in the middle for an open subway. Running all the way from downtown Chicago to the city limits—without a stop light or a cross street—because it is "down in the ditch," below the level of regular streets. That's the Congress Street Super Highway now under construction in Chicago.

Faced with the tremendous task of earth moving and construction involved, plus a tight time schedule, the Thomas McQueen Company, a prime contractor on the job, turned to Alemite Portable Service Stations to protect vital equipment—and to save these *three* ways—

1. **SAVE TIME!** By bringing complete power lubrication to all equipment right on the job—safely, efficiently.
2. **SAVE MONEY!** By cutting expensive lubrication "downtime"—increasing output of both men and machines—and slashing operating and lubrication costs.
3. **SAVE EQUIPMENT!** By greatly reducing the possibility of costly bearing failure—keeping rigs running smoother longer.

Get these four services with Alemite portable service stations

Fast, easy lubrication of track rolls and fittings.

No oil wasted—use exact amounts of lube desired.

Quick filling of gear housings, transmissions, final drives.

Air line equipment for tire inflating, air jet cleaning.

ALEMITE, Dept. W-113
1850 Diversey Parkway, Chicago 14, Illinois

Gentlemen:
Please send me FREE your illustrated booklet containing complete information on Alemite Portable Service Stations and Alemite Equipment.

Name .....

Company .....

Address .....

City ..... State .....

ALEMITE

A PRODUCT OF SW STEWART WARNER

1954 capital spending to stay high McGraw-Hill spot survey finds

But emphasis will be on equipment and modernization, not on new capacity. Defense expansion is ending

Manufacturing industries now plan to spend about $11.7 billion for new plants and equipment in 1954, only about 8% less than they planned to spend in 1953. That's the estimate made by the McGraw-Hill Economics Department, after a special interim survey in October. The regular survey of capital spending plans will be made early next year.

The October checkup finds that most planned cutbacks in capital spending for 1954 are related to completion of defense expansion programs. There aren't many cutbacks being planned because company managements fear a business recession.

However, the survey shows that it's the big companies, with long-range modernization and expansion programs, which are providing the main support for capital spending. Nearly all these companies are sticking to the long-range plans for 1954 which they reported to McGraw-Hill last February. As in 1953 planned capital spending, smaller companies are continuing to cut down on investment, as they did in 1953.

• **Emphasis on equipment**—However, the emphasis for 1954 is not on new construction or expansion of capacity. It's on new equipment to produce new products or diversify existing product lines. That means that industrial spending for new construction in 1954 may drop more, percentage-wise, than capital spending as a whole.

You can see from the table (below) that the big declines in 1954 spending plans are in steel, chemicals, miscellaneous groups, and textiles. The only groups that plan big increases are the auto makers and the manufacturers of electrical machinery.

• **Steel cuts back**—Steel shows the largest drop in capital spending, compared with 1950. Although there are some modernization plans under way, most companies are through with expanding capacity. The auto industry is getting ready for a fierce competitive battle by putting in new equipment to make new models, and adding facilities to make automatic transmissions and other special accessories.

Makers of electrical machinery are still expanding to meet the tremendous demand for electronic equipment. In the general machinery field, firms making products like office and air-conditioning equipment are planning to spend more. But companies making construction, farm and mining equipment will spend less.

The drop in capital spending by the chemical industry is concentrated in heavy chemicals and rayon chemicals, where capacity has outstripped demand. The petroleum industry plans to keep on spending pretty much at the 1953 level. And the decline in the "miscellaneous" group is largely accounted for by the expected cutback in spending by producers of aluminum.

EXPENDITURES FOR NEW PLANT AND EQUIPMENT

(Millions of Dollars)

Industry	Est. 1953	Plans 1954	Increase or Decrease
Steel	$1,460	$1,108	−24%
Automobiles	923	1,063	+15
Machinery	899	805	−10
Electrical Machinery	463	512	+10
Transportation Equipment	215	196	−9
Food	841	841	0
Petroleum	2,824	2,757	−2
Chemicals	1,800	1,546	−14
Textiles	296	260	−12
Other Manufacturing*	2,969	2,595	−13
Total Manufacturing	**$12,690**	**$11,683**	**−8**

* Includes non-ferrous metals (refining and fabricating), building materials, containers, paper, rubber, furniture and apparel.

Source: 1953, Department of Commerce; 1954, McGraw-Hill survey.

Detroit lumber terminal offers stop-off service

When a carload of lumber leaves a western mill headed for eastern markets, the producer who ships it cannot be sure who the ultimate buyers will be or what selling price will be in effect when a sale is made.

For, while the carload is in transit, lumber prices may drop, or the customer may decide to change his order. If this happens, the mill may be compelled to dump the lumber en route at distress prices, or attempt to turn it over to a dealer for storage or sale.

That's why a Detroit lumber yard has set up permanent storage facilities for lumber in transit to eastern markets. River Lumber Co., Inc., with a 50,000-sq ft terminal combined with outdoor storage space, has capacity for 20 million bd. ft. Although some eastern dealers provide storage space, the Detroit firm believes it has the only lumber terminal of its kind in the Midwest.

Mill operators using the terminal pay these extras: a switching charge for the freight car, an unloading charge and storage charge, plus reloading charges if the dealer decides to reship. In that case, the mill would not pay any more freight, since the terminal has sorting and transit privileges. The Detroit terminal will attempt to sell the lumber locally if the mill chooses to do so.

MC&S buys steel plant, will supply it with scrap

When a contractor buys a steel plant, that's news. Fast-expanding Merritt-Chapman & Scott Corp. has just picked up Milton Electric Steel Corp., of Milton, Pa., a subsidiary of Harrisburg Steel Corp.

Louis E. Wolfson, president and board chairman of MC&S, says that the plant will tie right into the construction business. Milton Electric has two electric furnaces, with an annual capacity of about 54,000 tons, and a bar mill. It turns out carbon and alloy steel bars, bar-size shapes, and reinforcing steel.

MC&S expects to use about 20%

of the mill's production, and will sell the rest on the open market. It also plans to supply the mill with a considerable amount of steel scrap from its construction operations.

Late this month MC&S shareholders will vote at a special meeting on a proposal to increase authorized common stock from 1,000,000 to 3,000,000 shares. Wolfson says that the additional common is needed "to provide for exchanges of shares in acquiring additional properties under future expansion plans."

(*Business Finance cont. on page 94*)

CONSTRUCTION TRENDS

Annual house starts may drop below 1,000,000 for next few years, but long-range outlook for housing is good

In spite of troubles with mortgage money, this is going to be a good year for home builders. The McGraw-Hill Economics Department estimates that builders probably will start about 1,075,000 units this year—which would be the third highest total on record. But home builders aren't likely to reach this figure again in any one of the next four or five years.

As McGraw-Hill economists see it, several factors are likely to keep starts below the million mark. They are:

- A decline—or at least a temporary leveling off—in consumer income as the current business "readjustment" gets under way.
- A decline in formation of new families, reflecting the low birth rate of the 1930s.
- A slowdown in migration from rural areas to cities, and from cities to suburbs.
- Difficulties in resale of existing homes.
- A decline in public housing, as forecast.

Many home builders will not agree with this forecast. In general, builders feel that they can sell just about as many houses as mortgage lenders are willing to finance. However, builders have been riding the almost uninterrupted postwar rise in consumer income. The McGraw-Hill Economics Department believes that, if business follows its expected course, consumer income may be down 5% or more by the end of 1954.

This probably would have more effect on housing than on other consumer goods, because many families could easily adjust to a drop in income by remaining in their present quarters instead of moving to larger ones. Even if consumer income levels off instead of declines, there probably will be a slowdown in the postwar process of "upgrading" housing standards.

There will be fewer new families to buy houses. The Census Bureau expects that, under the most favorable conditions, in the second half of the 1950s family formation will drop from its present level of around 750,000-800,000 a year to 650,000. If conditions are only just "medium," Census estimates that there may be only 500,000 new families each year for a while.

A slowdown of the postwar boom also would affect the big migration to the West Coast and to industrial areas generally, caused by the high rate of postwar employment. This migration has been a big factor in the housing picture. Of at least equal importance has been the migration from cities to suburbs—a trend that has developed from the upgrading of family income. A slowdown of income growth would mean a smaller annual addition to the middle-class group which most typically leaves the cities for the suburbs.

The price trend of existing homes is also important to the market for new houses, since people who want new homes must often sell their old ones. If consumer income starts to drop, prices of all houses also would tend to go down.

This would have two very unfortunate effects on sales of new homes. In the first place, some home owners who want new houses could not take a loss on their present houses without taking cash out of their pockets. The Federal Reserve Board estimates that about one-third of owner-occupied homes were bought since 1948, most on very thin equities. In the second place, there might be some distress selling by people who are unable to keep up payments.

In other words, even a modest decline in house prices would discourage many potential home buyers by pointing up the almost-forgotten dangers of owning an inadequately financed house. These dangers have been kept in the background for many years by rising income and employment, plus the steady rise in housing values.

The McGraw-Hill economists expect about 925,000 starts (private and public) in 1954. That might seem like a depression level to many builders and building-supply people. And of course it would hurt some of them. Yet 925,000 would be more homes than were built in any one year before 1948, except for the boom year of 1925.

And here's a cheerful note. The total amount spent on new housing is not likely to decline by as much as the number of starts. Spending for the "fix-up" market is expected to increase under any conditions short of a real depression. Fix-up business now amounts to about one-third of all spending for home building and maintenance, perhaps $6.5 billion annually. This type of business might rise rapidly if people have to stay in quarters they consider inadequate.

In the long run, there are a number of positive factors which should bring housing back to high levels:

- Both political parties want prosperity. Housing is one of the areas where the government can most easily act to improve conditions when the economy is declining.
- The record number of children now growing up will push many families out of their present quarters as soon as they can afford to move.
- Because the proportion of older people is increasing in our population, the number of childless households is expected to increase. This means the need for dwelling units will increase faster than figures on family formation indicate.
- Migration to the suburbs will continue, though it may be slowed for a while by economic "readjustment."

How to keep informed on the "with what" part of your business

AT YOUR FINGER TIPS, issue after issue, is one of your richest veins of job information—advertising. You might call it the "with what" type—which dovetails the "how" of the editorial pages. Easy to read, talking your language, geared specifically to the betterment of your business, this is the kind of practical data which may well help you do a job quicker, better—save your company money.

Each advertiser is obviously doing his level best to give you helpful information. By showing, through the advertising pages, how his product or service can benefit *you* and *your* company, he is taking *his* most efficient way toward a sale.

Add up all the advertisers and you've got a gold mine of current, on-the-job information. Yours for the reading are a wealth of data and facts on the very latest in products, services, tools . . . product developments, materials, processes, methods.

You, too, have a big stake in the advertising pages. Read them regularly, carefully to keep job-informed on the "with what" part of your business.

McGRAW-HILL PUBLICATIONS

Hollyday plans to improve house trade-in program

One of the biggest obstacles to the National Association of Home Builders' house trade-in program (ENR May 14, p. 151) is the fact that Federal Housing Administration rules treat old houses differently than new ones. Under present law, FHA can insure higher loans on new houses—up to 95% of appraised value for the first $7,000. On existing houses, the top insurance limit for FHA is 80% of value.

When Congress meets in January, FHA Commissioner Guy Hollyday will propose that the law be changed to put existing houses on a par with new homes. Builders now taking trade-ins find it's relatively easy to sell new houses. But after they have reconditioned an older house taken in trade, they find it much more difficult to find a buyer with enough cash to make the greater down payment that is necessary.

Under the trade-in plan, FHA offers builders a dual commitment on "second-hand" houses: one for the house in its present condition, and another when certain specified improvements are made. Using this commitment as collateral, the builder can proceed with arrangements to finance improvements.

Business briefs . . .

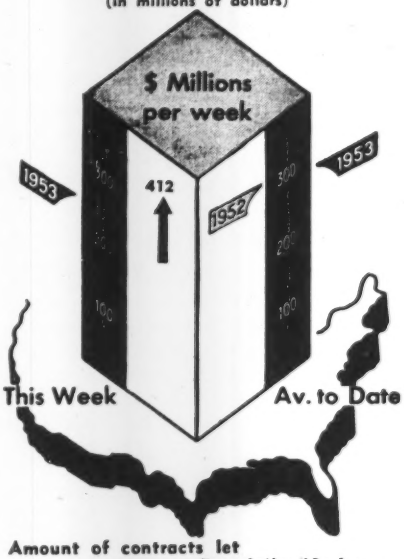
• **One-for-one program picks up:** Federal National Mortgage Assn. sales of mortgages under the one-for-one plan (ENR—Aug. 13, p 92) have picked up sharply lately, reflecting improvement of the mortgage market. From late July through the end of September, Fanny Mae had sold only $27 million of mortgages. By the end of October, the sale figure had reached $69 million.

• **Wallace & Tiernan, Inc.,** and Novadel-Agene Corp., a manufacturer of chemicals, plan to merge through an exchange of stock. Both companies are located in Belleville, N. J. W&T already owns a 41% interest in the other firm.

• **Kochring Co.,** Milwaukee manufacturer of construction equipment, expects to offer about 60,000 shares of common soon. Proceeds from the sale are expected to be about $1,250,000. This money will be used to replace working capital spent in the recent purchase of the Canadian firm, Waterous, Ltd., and also for plant improvements.

Activity This Week

As reported to ENR
(in millions of dollars)



Amount of contracts let

	This Week	Cumulative 46 wks— 1953	1952	% chge
Federal	$23.6	$1,298.1	$4,308.6	−70
State and municipal	107.0	4,431.4	3,712.2	+19
Total pub.	130.6	5,729.5	8,020.8	−29
Total priv.	121.1	7,540.6	6,288.5	+20
U. S. total	**$251.7**	**$13,270.1**	**$14,309.3**	**−7**
Contracts by type of work				
Waterworks	$3.7	$208.6	$201.7	+3
Sewerage	10.3	387.0	262.0	+48
Bridges	9.4	610.4	382.4	+60
Highways	46.3	1,591.8	1,308.4	+22
Earthwork, waterways	12.3	331.0	438.9	−25
Buildings:				
Public, excl. hsg.	32.0	1,510.5	4,123.0	−63
Housg., pub.	8.6	355.0	558.9	−36
Housg., priv.	55.8	3,147.6	2,670.9	+18
Commercial	18.0	1,037.5	644.0	+61
Industrial	41.7	2,530.2	2,508.9	+ 1
Unclassified	13.6	1,560.5	1,210.2	+29
Total	**$251.7**	**$13,270.1**	**$14,309.3**	**−7**

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

New capital for construction

	Week of Nov. 5 1953	Cumulative 45 Wks 1953	% chge 1952-53
Corporate securities	$41.7	$3,771.9	+13
State and municipal:			
Excluding housing	134.3	3,738.9	+41
Housing	0.1	261.5	−12
Federal loans	2.7	103.7	−68
Federal aid	...	770.9	+40
Total non-federal	**$178.8**	**$8,646.8**	**+21**
Federal appro.:			
In U. S.	...	1,566.7	−79
Outside U. S.	...	28.9	−85
Total new capital	**$178.8**	**$10,242.5**	**−31**

ENR indexes		Base Years = 100 1913	1926	1949
Construction cost	Nov 1953	610.92	293.67	128.07
	Oct	610.76	293.59	128.04
Building cost	Nov 1953	436.34	235.87	124.03
	Oct	436.31	235.86	124.03
Volume	Oct	528	215	153
	Sept	487	198	141

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $1.50 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record, 330 West 42nd Street, New York 36, N. Y.

Bids: December 7, 1953

Dock For Slip

Sealed bids will be received until 5:00 P. M., EST, December 7, A. D., 1953, in the office of the Broward County Port Authority for:

Dock for Slip No. 3

Bidding blanks may be obtained from the office of the Port Manager. Plans and specifications are on file in the office of the Port Manager, Administration Office, Port Everglades Station, Fort Lauderdale, Florida.

A certified check or bank check for 2% of the total amount of the bid payable to BROWARD COUNTY PORT AUTHORITY shall accompany each proposal as evidence of good faith and responsibility of the bidder. This check shall be retained by the payee as liquidated damages should the bidder fail or refuse to enter into a contract with the payee for the execution of the work embraced in the proposal, in the event the proposal of the bidder is accepted.

The Broward County Port Authority reserves the right to reject any or all bids.

R. T. Spangler, Port Manager

Bids: December 15, 1953

Construction of Chemical Building and Miscellaneous Structures

CHEMICAL BUILDING
AND
MISCELLANEOUS STRUCTURES
NORTHEAST STATION
FOR THE
DEPARTMENT OF WATER SUPPLY
CITY OF DETROIT, MICHIGAN
CONTRACT NO. NE-7

Sealed proposals for the construction of the Chemical Building and Miscellaneous Structures for the Northeast Station, at 11000 East Eight Mile Road, will be received by the Board of Water Commissioners of the City of Detroit. Proposals shall be addressed to the Board of Water Commissioners, City of Detroit, Room 506 Water Board Building, 735 Randolph Street, Detroit 26, Michigan, and shall be endorsed "Proposal for Contract No. NE-7". Proposals will be received until 2:00 P.M. Eastern Standard Time, December 15, 1953, at which time they will be opened and read aloud in the Board Room, Fifth Floor, Water Board Building, 735 Randolph Street, Detroit 26, Michigan.

Included in the work is the construction of the Chemical Building upon an existing reinforced concrete foundation, the Galleries upon the roof slab of Settling Basins now under construction, Raw Water Conduits, Venturi Meter Chamber, Chlorination Chamber, Raw Water By-Pass, Pedestrian Tunnel, and appurtenant structures. The Chemical Building, approximately 59 feet by 183 feet in plan, will be four stories above grade, with reinforced concrete substructure, and a superstructure consisting of structural steel framing with reinforced concrete floors and roof slab, masonry walls with limestone and granite facing and glazed tile interior finish. The Galleries, approximately 4100 square feet in area, will be one story high with masonry walls of face brick exterior and glazed tile interior finish, and with a reinforced concrete roof slab. The two 84-inch diameter Raw Water Conduits, approximately 463 feet long, will consist mainly of precast reinforced concrete pipe. The work also includes the furnishing and installation of pumps, sluice gates, storage tanks, chemical feed and handling equipment, rapid mixers, venturi meters, electric freight elevator, hoist crane, drain lines, heating, ventilating, plumbing and miscellaneous piping systems, and electrical power and lighting.

The Contract Documents, including the Notice to Bidders, the Forms of Proposal and Agreement, the Specifications, and the Contract Drawings may be examined during business hours, at the office of the Department of Water Supply, Room 706 Water Board Building, Detroit, Michigan. The Contract Documents may be obtained by making a deposit of Fifty Dollars ($50.00) per set, which sum will be refunded upon the return of the complete Contract Documents in good condition within thirty (30) days after the bid date, or if used in making a bona fide proposal.

As security for the acceptance of the Contract, each proposal shall be accompanied by a certified check in an amount not less than five per cent (5%) of the total lump sum price bid, drawn payable to the City of Detroit, Board of Water Commissioners, or a satisfactory bid bond which will hold and firmly bind the bidder and his surety unto the Corporation of the City of Detroit in the full amount of five per cent (5%) of the total lump sum price bid.

No proposal may be withdrawn for at least sixty (60) days after the scheduled closing time for receipt of bids.

The Board of Water Commissioners reserves the right to waive any informality in any bid and to accept any bid, or to reject any or all bids, should it deem it to be in the best interests of the City of Detroit to do so.

CITY OF DETROIT
BOARD OF WATER COMMISSIONERS
George A. Shaffer, President
Alfred J. Simpson, Vice-President
Harvey A. Wagner
Oscar Wagner
L. G. Lenhardt, Superintendent, General Manager and Chief Engineer
E. H. Bauer
Acting Secretary

Bids: December 18, 1953

River Interceptors

PROJECT WVA 46-P-5A, UNIT ONE, SUB-SECTION 3 & 4
KANAWHA RIVER INTERCEPTORS, PATRICK STREET TO ELK RIVER
CHARLESTON, W. VA.

The Sanitary Board of The City of Charleston, Charleston, West Virginia, will receive sealed bids for "Kanawha River Interceptors, Patrick Street to Elk River" until 2 P. M. Eastern Standard Time on the 18th day of December, 1953, at the office of The Sanitary Board, Room 15, City Building, at which time and place all bids will be publicly opened and read aloud.

ESTIMATED BID QUANTITIES

SUB-SECTION 3 Principal items
- 5400 lineal feet 60 inch diameter pipe sewer in tunnel, steel liner plate with concrete pipe lined and plain alternate.
- 400 lineal feet average 18" V.C.P. in tunnel regulator leads.
- 300 cubic yards regulator concrete.
- 390 vertical feet manholes.

SUB-SECTION 4 Principal items
- 3000 lineal feet 48" diameter pipe sewer in tunnel as in sub-section 3.
- 100 lineal feet 18" V.C.P. in tunnel.
- 20 cubic yards regulator concrete.
- 280 vertical feet manholes.
- Pool level or above.

Sand or clay strata. Cores and data for contractors information will be available in two weeks. Furnished as addenda, but not guaranteed by the owner.

The successful bidder will be required to furnish a satisfactory performance bond in the amount of 100 per cent of contract.

Liquidated damages for delay will be One Hundred Dollars ($100.00) per day for each calendar day beyond the date specified in the contract.

The contract documents, including plans and specifications are on file at the office of The Sanitary Board, City Building, Charleston, West Virginia, and at the office of Settle Engineers, Inc., 2nd Floor Peoples Building, Charleston, West Virginia, where they may be examined free of charge.

Copies of the documents may be obtained by depositing Forty Dollars ($40.00) with Settle Engineers, Inc., 2nd Floor Peoples Building, Charleston, West Virginia, for each set of documents so obtained. The amount of the deposit for one (1) set of documents will be refunded to each actual bidder who returns the plans and documents in good condition within five (5) days after the opening of bids.

The Sanitary Board of The City of Charleston reserves the right to reject any or all bids and to waive any informalities in bidding.

A certified check or cashier's check, payable to The Sanitary Board of The City of Charleston, West Virginia, or a satisfactory bid bond executed by the bidder and a surety company authorized to do business in West Virginia, in an amount of dollars at least equal to five per cent (5%) of the bid or an equal amount of U. S. Government Bonds, shall be submitted with each bid.

No bid may be withdrawn after the scheduled closing time for receipt of bids, for at least sixty (60) days thereafter.

THE SANITARY BOARD OF THE
CITY OF CHARLESTON
By: F. Duane Hill, Secretary

Bids: November 24, 1953

West Virginia Turnpike Comm.

Sealed proposals will be received by the West Virginia Turnpike Commission for:

Contract No. 42

The work to be done under Contract No. 42 consists generally of furnishing and installing the lighting for the Turnpike, complete and in readiness for use, exclusive of the power supply which will be furnished and installed by others. The lighting will be installed at two bridges and nine interchange or service areas, located along the Turnpike in northbound sequence as follows: Princeton Interchange; Bluestone Service Area; Beckley Interchange; Beckley Service Area; Mossy Interchange; Morton Service Area; Fourmile Fork Bridge; Chelyan Interchange; Kanawha City Interchange; Kanawha River Bridge and Charleston Interchange.

The lighting will be in series circuits generally and will include conduits, wiring, junction boxes, aluminum lighting standards and construction incidental thereto, including illuminated signs, and navigation lights on the Kanawha River Bridge.

The principal items of work include:

	Approximate Quantity
Trenching and Backfill	26,500 Lin. Ft.
Asbestos Cement Conduit	27,000 Lin. Ft.
Metal Conduit	1,250 Lin. Ft.
Junction Boxes	109 Each
Series Lighting Conductors	70,000 Lin. Ft.
Multiple Lighting Conductors	4,200 Lin. Ft.
Lighting Standards	155 Each

Proposals will be received at the office of the West Virginia Turnpike Commission, 1340 Wilson Street, Charleston 5, West Virginia, until 1:00 P.M., Eastern Standard Time, and thereafter at the House of Delegates Chamber, State Capitol, Charleston, West Virginia, until 2:00 P.M., Eastern Standard Time, on November 24, 1953, at which time and place said proposals will be publicly opened and read.

WEST VIRGINIA TURNPIKE
COMMISSION
D. H. Morton
Chairman

OFFICIAL PROPOSALS

Bids: November 19, 1953

New York State Road Work

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, Public Buildings Law, and special provisions for projects financed with Federal Aid funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time, on the 19th day of November 1953, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT No. 8				
		J. S. Bixby, District Engineer, Pleasant Valley Road, Poughkeepsie, New York				
Orange	FASH 53-15 FARC 53-129	Palisades Interstate Park-Goshen Pts. 1A & 1B; Central Valley-Turners, S.H. 115; Highland Mills-Monroe, S.H. 413; Monroe-Washingtonville, S.H. 9057 Project FI-IG-1050(7) Cont. #1, F-1050(8)	5.94 (Acc.) 6.94 (Hy.)	9" Cem. Conc. Pavt. 2 @ 25' Var. Wide = 9.95 Mi. Asp. Conc. Ty. 1A, Opt.= 2.85 Mi. Misc. Work = 0.08 Mi. 5 Hy. Seps. Comp. I-Beams 217.2', 194.5', 175.8', 186.2 & 207.4' 2 Brs. Twin Box 25' & 25' 2 Brs. Comp. I-Beams 57' & 57' Altering Exist. R.R. Br.	$382,000 Plans $100	$6,947,000
		DISTRICT No. 10				
		M. E. Gould, District Engineer, Montauk Highway at Little East Neck Rd., Babylon, L. I., New York				
Nassau	B.P. 53-51	Atlantic Beach Park District, Part 1	0.11	Beach Protection 3 Stone Groins	5% of Bid Plans $10	$13,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to the "Controlled Materials Plan" of the National Production Authority as well as to regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
SUPT. OF PUBLIC WORKS

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4072) will be received at Phoenix, Arizona, until December 1, 1953, for furnishing labor and materials for 115-kv transmission lines from Saguaro Steam Electric Station to Phoenix-Tucson No. 2 Tap, ED5 Substation and Oracle Substation. Location near Red Rock, Pinal County, Arizona. Principal items are: Furnishing and constructing 358 type HS, HA, HSB, 3A, 3AB, 3AC, 3AT, and 3T structures pole lengths 45 to 75 feet; furnishing and stringing 44.25 miles of three 750,000 circular mil ACSR conductors; furnishing and stringing 44.25 miles of two 3/8 inch, galvanized-steel overhead ground wires; and other work. Completion time 225 days. For particulars, address Bureau of Reclamation, Phoenix, Arizona; or Building 53, Denver Federal Center, Denver, Colorado.

W. A. DEXHEIMER, Commissioner

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-4073) will be received at Denver, Colorado, until December 3, 1953, for furnishing twelve (12) 7-foot 6-inch by 9-foot outlet gates for Palisades Dam, Palisades Project, Idaho. Delivery is desired within 570 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver, Colorado.

W. A. DEXHEIMER, Commissioner

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4075) will be received at Albuquerque, New Mexico, until December 1, 1953, for furnishing labor and materials for earthwork, clearing and structures for rehabilitation of drains, Unit SW-1, Middle Rio Grande Project, New Mexico. Location in the vicinity of Socorro, New Mexico. Principal items are: Cleaning and clearing approximately 20 miles of drains; excavation 1700 cu. yds.; furnishing and laying 570 lin. ft. corrugated metal pipe; and other work. Completion time 180 days. For particulars, address Bureau of Reclamation, Albuquerque, New Mexico; or Building 53, Denver Federal Center, Denver, Colorado.

W. A. DEXHEIMER, Commissioner

Contractors Watch This Section —

for new projects. Publish your announcements through the proposal sections of *Engineering News-Record* and get their bids.

Bids: December 3, 1953

Construction of Sewage Treatment Works

Marysville, Michigan

Sealed proposals will be received by the City Clerk at the City Hall at Marysville, Michigan until 3 P.M. E.S.T. December 3, 1953 for construction of a sewage pumping station and sewage treatment plant.

No bid may be withdrawn for at least thirty days after date of receiving bids.

Contract documents may be procured at the office of the City Clerk or at the office of the Engineers.

A deposit of $15.00 will be required for contract documents which will be returned to bona fide bidders. $10.00 will be returned to non-bidders.

A certified check or bid bond in the amount of 5% of bid price acceptable and made payable to the City Treasurer of the City of Marysville, Michigan must accompany each proposal.

The deposit of the successful bidder shall be forfeited if he fails to properly execute the contract and bonds within ten days after award.

The City reserves the right to reject any or all bids, waive informalities or accept any bid it may deem to be best.

Mildred Falardeau
City Clerk

Pate and Hirn, Engineers
532 Michigan Building
Detroit, Michigan

Bids: November 24, 1953

Dwelling Unit Increment

HOUSING AUTHORITY OF THE CITY OF LOS ANGELES, CALIFORNIA
1401 EAST FIRST STREET
LOS ANGELES 33, CALIFORNIA
FOR PART 2-5/140 DWELLING UNIT INCREMENT
PUEBO DEL RIO EXTENSION
PUBLIC HOUSING ADMINISTRATION
PROJECT NO. CAL 4-15
LOCATION 53rd STREET, 55th STREET AND LONG BEACH AVENUE
LOS ANGELES, CALIFORNIA

Plans and Specifications
Prepared By
Theodore Criley, Jr. and Henry C. Burge
Architects
510 Knight Way, LaCanada, California
Telephone: SYlvan 0-3202

Invitation for Bids will be published October 16, 1953. Revised Plans and Specifications dated October 16, 1953 and Bidding Documents ready for distribution October 20, 1953.

Bids to be opened 2:15 P.M. (P.S.T.) November 24, 1953.

For further information regarding bidding Telephone ANgelus 2-2121, Extension 55.

Bids: December 16, 1953

State Project No. 62-02-22

Sealed proposals for the construction of the following project will be received by the Louisiana Department of Highways, Room 307, Highway Office Building, Baton Rouge, Louisiana until 10:45 A.M. on Wednesday, December 16, 1953. After 10:45 A.M. proposals will be received in Room 305, Highway Building No. 3, until 11:00 A.M. No proposals will be received after 11:00 A.M. At 11:00 A.M. of the same day and date, they will be publicly opened and publicly read in Room 305, Highway Building No. 3.

STATE PROJECT NO. 62-02-22, Belle Chasse Tunnel Under The Algiers Cut-Off Canal on State Route No. 31, in Plaquemines Parish, Louisiana.

All as described in plans and specifications prepared by Palmer and Baker, Inc., Consulting Engineers, and approved by the Chief Engineer of the Department of Highways.

Plans and specifications may be examined and information obtained from Palmer and Baker, Inc., P. O. Box 346, Mobile, Alabama. Plans and specifications may also be examined at the Louisiana Department of Highways, Baton Rouge, Louisiana. Complete copies of same will be furnished bona fide bidders at Louisiana Department of Highways upon deposit of $100.00 per set. The deposit, if a bid has been made, for one set will be remitted if papers are returned in good condition, not later than thirty (30) days after the opening of bids. All sets must be returned within thirty (30) days.

A certified check on a State or National bank in good standing for 5% of the amount bid, payable to the Louisiana Department of Highways, must accompany each bid as a guarantee that the bidder, if successful, will enter into Contract and make bond in accordance with the requirements of the Specifications. A bidder's bond will not be accepted. The Department reserves the right to reject any and all bids. All bids shall be submitted in sealed envelopes bearing on the outside the name of the Bidder, his address, and the number of the project for which the bid is submitted. If forwarded by mail the sealed envelope containing the bid, and marked as directed above, shall be enclosed in another envelope addressed to

Department of Highways
Room 307
Highway Office Building
Baton Rouge, Louisiana

All bids will be retained by the Department and will not be returned to the bidders. No bid tendered later than the time specified will be accepted.

LOUISIANA DEPARTMENT OF HIGHWAYS
George S. Covert
Director

OFFICIAL PROPOSALS

Bids: December 8, 1953

Construction of Interceptor Sewer

OFFICE OF PURCHASING AGENT
CITY OF NASHVILLE, TENNESSEE
BIDS FOR PROJECT NO. 53-SD-2
NASHVILLE, TENNESSEE

Sealed proposals or bids will be received by the City Purchasing Agent of the City of Nashville, Tennessee, at Room 209 Courthouse—City Hall Building, until ten (10) o'clock A. M., on the 8th day of December, 1953, for furnishing of all materials, labor, tools, and appliances necessary for construction of:

LEFT BANK UPSTREAM OPEN-CUT INTERCEPTOR SEWER

Copies of the proposal, contract, documents, plans and specifications, may be obtained from the office of Rice, Harwood and Clark, Architect-Engineers, 905 American Trust Building, Nashville, Tennessee.

A charge of FIFTEEN ($15.00) DOLLARS will be made for each set of contract documents, proposal, plans and specifications. Deposit will be refunded in full amount and applicable to the first set obtained and returned by contractors submitting a bona fide bid. Deposit, less one-half principal sum thereof retained to cover cost of production and handling, will be refunded on all other sets returned within ten (10) days after opening of bids.

Each proposal or bid must be accompanied by a cashier's or certified check on a State or National Bank made payable to the City of Nashville, Tennessee, or a bidding bond executed by the bidder and a surety company authorized to transact business in the State of Tennessee, in the sum of not less than five (5%) per cent of the total amount of the bid. Said check or bond will be returned to the unsuccessful bidders as soon as contract has been awarded and to the successful bidder as soon as he has executed the contract and furnished the necessary bonds, and the same have been approved by the City Attorney and the contract has been executed by the City.

All bidders must be licensed contractors as required by Chapter 135 of the Public Acts of 1945 of the General Assembly of the State of Tennessee. Bidders name and license number must be placed on the sealed envelope containing these documents.

All bids must be made out on proposal form bound in the specifications. No interlineations, additions or deletions shall be made in the proposal form by bidder. The proposal form must not be detached from the specifications.

The City of Nashville, Tennessee, through its Mayor, reserves the right to reject any and/or all bids, to waive any informalities in the bids received and to accept any bid, which, in its opinion, may be for the best interest of the City.

E. B. Smith,
Purchasing Agent
The City of Nashville, Tennessee.

OFFICIAL PROPOSALS

Bids: December 7, 1953

Philadelphia, Penna. Procurement Department Water Department

Sealed Proposals will be received in Room 313 City Hall Annex, until 1:30 P. M., EST, MONDAY, DECEMBER 7, 1953, and opened at that time in Room 313 City Hall Annex, Philadelphia, Pennsylvania, for **BID NO. 2073**—(Contract SD-120-SE); **BID NO. 2074**—(Contract SD-121-SE); **BID NO. 2075**—(Contract SD-122-SE); **BID NO. 2076**—(Contract SD-123-SE).

The work covered by Bid No. 2073 consists of general construction work, furnishing and installing mechanical equipment and piping for a blower and primary sludge pumping building. The building is approximately 51' wide by 60'6" long, one story with basement, the sub-structure is reinforced concrete, superstructure steel framing with brick walls. The mechanical equipment consists of 2-1500 CFM positive displacement blowers, 2-250 GPM sludge pumps, 2-500 GPM sludge pumps, 4 screw pumps—6" discharge, 2 plunger pumps and appurtenant work.

The work covered by Bid No. 2074 includes all plumbing work, and Bid No. 2075 all heating installations for the building. The work covered by Bid No. 2076 consists of the furnishing and installation of all electrical equipment and appurtenant work.

Proposal forms, specifications, questionnaires and blueprints may be obtained in Room 1131 City Hall Annex. A deposit of Twenty-five Dollars, ($25.00), in cash or certified check is required for each set of blueprints and specifications. This sum will be refunded within ten (10) days after the bids are received, providing said specifications and blueprints are returned in an unmarked and undamaged condition.

No bids will be received unless bidder is qualified by the Procurement Commissioner. The questionnaire form with all questions fully answered must be filed with the Water Commissioner, 1103 City Hall Annex, Philadelphia, Pennsylvania, at least one (1) week prior to the date of opening bids.

Each proposal must be accompanied by security in form and amount as set forth in the proposal.

A. ALBERT CHERASHORE,
Procurement Commissioner.

OFFICIAL PROPOSALS

Bids: November 19, 1953

Furnishing and Delivering Standardized Mechanical Joint Cast Iron Water Pipe

WASHINGTON SUBURBAN SANITARY COMMISSION
CONTRACT NO. 1328-W
FURNISHING AND DELIVERING
STANDARDIZED MECHANICAL JOINT
CAST IRON WATER PIPE

Sealed proposals for furnishing and delivering fifty-thousand (50,000) lineal feet of 6-inch; fifty-thousand (50,000) lineal feet of 8-inch Mechanical Joint Pipe, Class 150, unlined and twenty-thousand (20,000) lineal feet of 10-inch; five-thousand (5,000) lineal feet of 12-inch; two-thousand (2,000) lineal feet of 16-inch and one-thousand (1,000) lineal feet of 24-inch Mechanical Joint Pipe, Class 150, cement lined will be received at the office of the Purchasing Agent of the Washington Suburban Sanitary Commission, 4017 Hamilton Street, Hyattsville, Maryland until Wednesday, November 18th, 1953 at 11:00 A. M., Eastern Standard Time at which time and place they will be publicly opened and read.

Specifications may be obtained from W. R. Douglas, Purchasing Agent of the Commission.

Raymond W. Bellamy, Chairman
L. S. Ray
J. Norman Ager
Commissioners

Attest:
James B. Parkhill
Secretary-Treasurer

Contractors—

You have made the BID

You have other jobs to Complete

The Equipment to use on either a Rental or Purchase basis will be found on these pages. Check them NOW and see the Savings you can make.

CLASSIFIED SEARCHLIGHT SECTION ADVERTISING

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:
(Not available for equipment advertising)
$1.50 cents a line, minimum 3 lines. To figure advance payment count 5 average words as a line.
POSITION WANTED & INDIVIDUAL SELLING OPPORTUNITY WANTED undisplayed advertising rate is one-half of above rate, payable in advance.
PROPOSALS, $1.50 a line an insertion.

INFORMATION:
BOX NUMBERS count as 1 line additional in undisplayed ads.
DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).
EQUIPMENT WANTED or FOR SALE Advertisements acceptable only in Displayed Style.

DISPLAYED—RATE PER INCH:
The advertising rate is $17.10 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
AN ADVERTISING INCH is measured 7/8 inch vertically on one column, 3 columns—30 inches —to a page. E.N.R.

Send NEW ADVERTISEMENTS: To New York City Office, 330 W. 42nd St., N. Y. 36 for November 26th issue closing November 13th.

DESIGN ENGINEERS

With structural and concrete design experience applicable to Blast Furnace or Steel Plant Design.

also

PIPING DESIGNERS

With experience applicable to Oil Refinery Design.

Openings available at our Cleveland, Ohio office.

Top Hourly Rates
Permanent Positions
Overtime—45 hour week
No Age Limitations

Write, giving complete background and experience to:

ARTHUR G. McKEE & CO.
2300 Chester Avenue
Cleveland 1, Ohio

DESIGN ENGINEERS

For design of special medium weight automatic equipment. Will be called upon to experiment with and recommend improvements to existing equipment as well as design of new equipment. Degree in mechanical engineering desirable. Should have a minimum of five years of design experience.

Location: Chicago. Compensation dependent upon experience and ability. Position is not dependent on defense contracts and is permanent and offers good working conditions with excellent company benefits.

Replies will be treated confidential and arrangements will be made to interview selected applicants. Submit complete resume stating experience, education, salary required and date available.

P-9737, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

WANT EXPERIENCED, STRUCTURAL STEEL, MISCELLANEOUS, & ORNAMENTAL IRON DETAILERS—CHECKERS
Excellent working conditions, highest salary. Permanent.

CAPITOL STEEL & IRON COMPANY
1726 S. Agnew, Oklahoma City 8, Okla.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

WANTED—BUILDING Construction Estimator —By old established North Jersey Company —Must be experienced with emphasis on Industrial Construction. Must have engineering background and be able to handle the complete estimate. Excellent Salary—Profit Sharing—Opportunity to advance—Age 32-42. P-9232, Engineering News-Record.

WANTED: EXPERIENCED estimator, engineering background preferable. Must be capable of take-off, pricing, scheduling, etc., Business located in South Dakota. Firm well established, progressive, in business since 1930. Salary open. P-9534, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT for large Middle West Central Contractor. Must be able to take complete site management of institutional, industrial and commercial buildings of any size. Permanent connection. Please send full details of education, experience, age and other pertinent information, care of P-9557, Engineering News-Record, 520 No. Michigan Ave., Chicago, Ill.

MIDWEST ENGINEERING firm needs engineers experienced in highway and bridge design for permanent work on urban expressway projects. Reply giving full experience record, personal history and salary wanted. P-9602, Engineering News-Record.

WANTED: STRUCTURAL steel detailer and checker for small fabricating shop. Prefer married man of mature age with at least 5 years actual experience capable of making estimates and mill orders. Have attractive position to offer. Give resume of experience, age, and salary. Write Berger Steel Company, Lafayette, Indiana.

HIGHWAY DESIGN Engineers — Must have background of experience in highway design and preparation of contract drawings. Large expressway project located in vicinity of Baltimore, Maryland. Furnish full information regarding education, experience, age and references. Starting salary six thousand two hundred forty dollars ($6,240.00 per year). Replies confidential. Associated Consulting Engineers, 1606 Kelly Avenue, Baltimore 9, Maryland.

WANTED: CIVIL Engineer, graduate with between five and ten years general surveying experience with heavy exposure to property surveys. Permanent position offering excellent growth potentialities with firmly established company emphasizing photo grammetric engineering and cadastral mapping services. Location—Northeastern United States. Write full particulars, including education, availability, experience, career objectives, and salary requirements to P-9632, Engineering News-Record.

DRAFTSMAN WANTED—Experienced for detailing miscellaneous and/or structural steel by Rishpell Steel Company, P. O. Box 2579, Jacksonville, Florida. Reply giving brief resume of experience, education, availability, and salary expected.

STRUCTURAL ENGINEER — with at least 10 years experience in estimating, design and supervision, for a Mid-West Contractor's Office. Reply stating age, experience, etc. P-9744, Engineering News-Record.

(Continued on the opposite page)

SENIOR FIELD ENGINEERS

Electrical Civil Mechanical

Graduate engineers with responsible field experience on steam power plants or related heavy industrial projects. Require experience in directing the mechanical, electrical or civil-structural phase of a major construction project.

Please write giving complete qualifications, references, and salary requirements. Your reply will be confidential.

BECHTEL CORPORATION
220 Bush St. San Francisco, Calif.

WANTED
EXPERIENCED ESTIMATOR

On general heavy construction in Pennsylvania, New Jersey and Delaware. State experience and salary.

P-9727, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

CIVIL ENGINEERS

Work on hydro-electric power developments. Write giving full experience record, qualifications and salary desired.

HARZA ENGINEERING COMPANY
400 West Madison St., Chicago 6, Illinois

WANTED
EXPERIENCED GENERAL SUP'T.

On heavy construction in the East, able to take charge from estimating to completion. 1ST rate only. State experience and when available.

P-9733, Engineering News Record
330 W 42 St., New York 36, N. Y.

WANTED: TUNNEL SUP'T.

By Philadelphia Concern. Experienced from bidding to completion. State qualifications and salary.

P-9730, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

JR. CIVIL ENGINEERS FOR CALIFORNIA

Permanent positions in California's huge highway program. Wide choice of locations. High-grade professional experience. Open to CE graduates or to non-graduates with 2 years' experience. $378 to start, raise in six months. Positions open at this level only.

STATE PERSONNEL BOARD
1015 L Street Sacramento 14, Calif.

POSITIONS VACANT
(Continued from opposite page)

ENGINEER BY trade association in Washington, D. C. Construction experience preferred. Write giving experiences, references, salary expected to P-9718, Engineering News-Record.

STAFF ASSISTANT to General Superintendent for combination structural fabricating and structural steel warehousing organizing of medium size in Western Pennsylvania. Practical background in administrative controls such as production planning, scheduling, cost reports; materials storage, layout, work measurement, methods improvement. Persuasive ability to really plug ideas for improvement to "hard-to-sell" superintendent and department managers. Excellent salary and company benefits which include company paid group insurance and hospitalization, sick leave and annual paid vacation. Write giving age, education, experience, personal qualifications. P-9695, Engineering News-Record.

REGISTERED CIVIL Engineer. General Municipal Technical and Administrative Duties. $327-$425 commensurate with experience. City of Delray Beach, Florida. Apply City Manager.

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PW-9691, Engineering News-Record
68 Post St., San Francisco 4, Calif.

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PW-9734, Engineering News-Record
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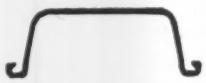

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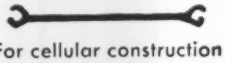

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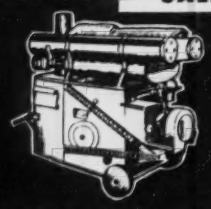

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LOADING, the Model 105 utilizes the forward motion of the machine and automatic crowding action of the loading mechanism to take full bites.

UNLOADING, the bucket is carried backward by the rocking cams. A backstop halts rearward motion, and the bucket may be slammed to dislodge sticky materials.

Eimco's 105—a "big gun" in shovel-loaders

Compared with the Model 104 rocker-shovel it's bigger, more powerful, easier handled

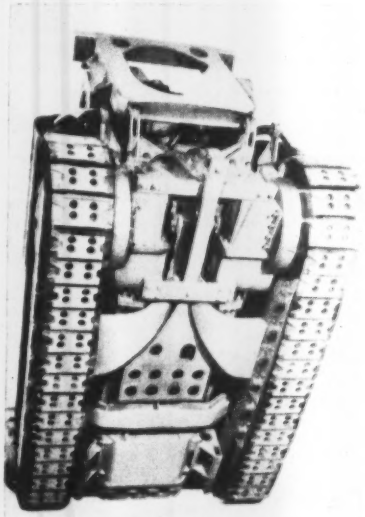
From bucket to ballast the Eimco 105 is new—only the rocker loading and dumping principle of the previous model have been retained.

With this method of operation the 1½-yd. bucket is loaded at the front of the machine by a combination of forward motion of the tractor and crowding by rocker arm action. After a load is secured, the bucket is carried back by the rocking cams to be unloaded at the rear of the machine. The bucket is returned to its forward position by gravity.

However, the 105 is more than just an excavating unit. More appropriately it should be considered a new heavy prime mover with its own excavating attachment and other tools.

• **Heart of the new tractor** and the most important new feature is the transmission—a combination of torque converter, constant mesh gear trains and hydraulically actuated clutches contained in one compact unit. With this unit, all movements of the tractor are controlled by two levers that can be manipulated by one hand. An easy push on both levers moves the tractor forward and a pull reverses the machine. Twisting the levers, i.e., moving them in opposite directions, results in a spin turn with one track running forward, the other reversed. Releasing either lever so it automatically returns to neutral permits a feathered turn, or the track brake may be used to give a conventional turn. Brakes, used mostly for parking, are the air-cooled, disk-type. An additional brake, which is used for bucket control, is of the same type.

Clutches within the transmission are the oil-cooled, positive-engagement type not requiring adjustment. They run in a sealed oil bath and all wearing parts are pressure lubricated.



UNDER VIEW shows heavy cast and welded steel construction.

• **The power train**—Power from a 90-hp diesel engine (General Motors 3080 or equivalent) passes through a torque converter to a two-speed reversing clutch and constant-mesh gear train in the unit transmission. From the transmission two shafts extend rearward. These transmit power to the two final drives—one for each track. Unconventionally, these final drives have no clutches, brakes or complicated assemblies in the drive case.

At the rear of the engine a direct drive shaft is equipped with a multiple V-belt pulley that serves as a rear power take-off. The two-speed loader mechanism—twin chain reels, clutches and speed changer—is powered from this pulley; bucket drive clutches and speed changer are hydraulically actuated in this new model.

• **Features for the operator** include a 50-yard line seat well up front of the machine where he has a commanding view of the loading operations. The cab is enclosed, with the driver well protected.

Besides the two track control levers a third hand lever selects speed while engine throttling may be by either foot or hand control. Two other levers are used to control bucket speed and motion.

During the dumping cycle the rearward motion of the bucket is halted by the backstop. There the bucket may be held, shaken or returned to loading position. Further, the bucket may be held in any desired position during either the dumping or return cycles.

• **Modification**—The Model 105 is

11,362 square foot exterior of this laboratory erected by 5 men in 25 days with Stainless Steel Panel Construction

CORNER AND WINDOW VIEW of the Laboratory showing how effectively the two types of panels are combined in this building.

TWO TYPES of Stainless Steel panels—fluted-face and flat-face—combine to give the Metallurgical Laboratory at United States Steel's Fairless Works an attractive exterior. Architect: Hoffman and Crumpton, Pittsburgh, Pa. General Contractor: Joseph R. Farrell, Inc., Philadelphia, Pa. Stainless Steel panels fabricated and erected by The H. H. Robertson Company, Pittsburgh.

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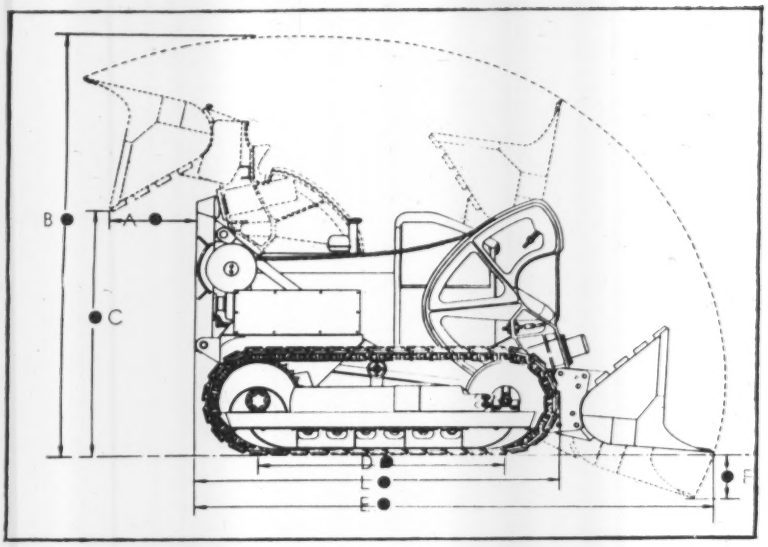

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D—Length of tracks on ground	95 in.
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Standard	16 ft 6 in.
Low	15 ft 2 in.
F—Digging depth below grade	17 in.
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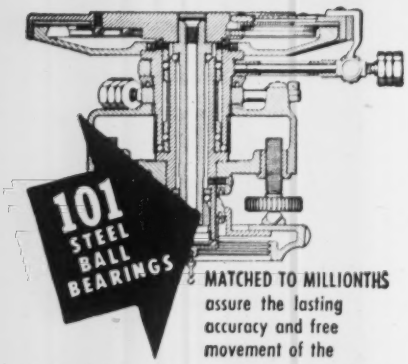

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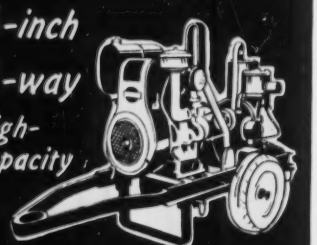

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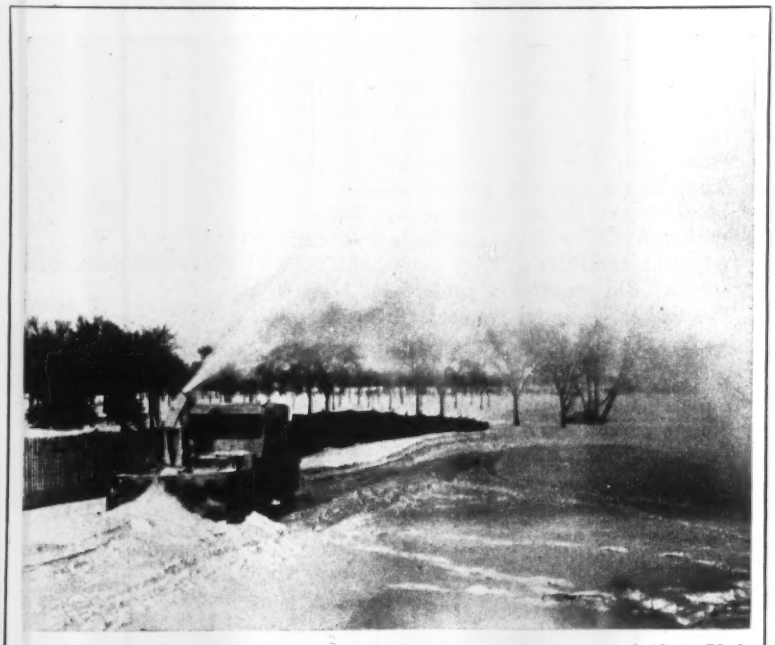
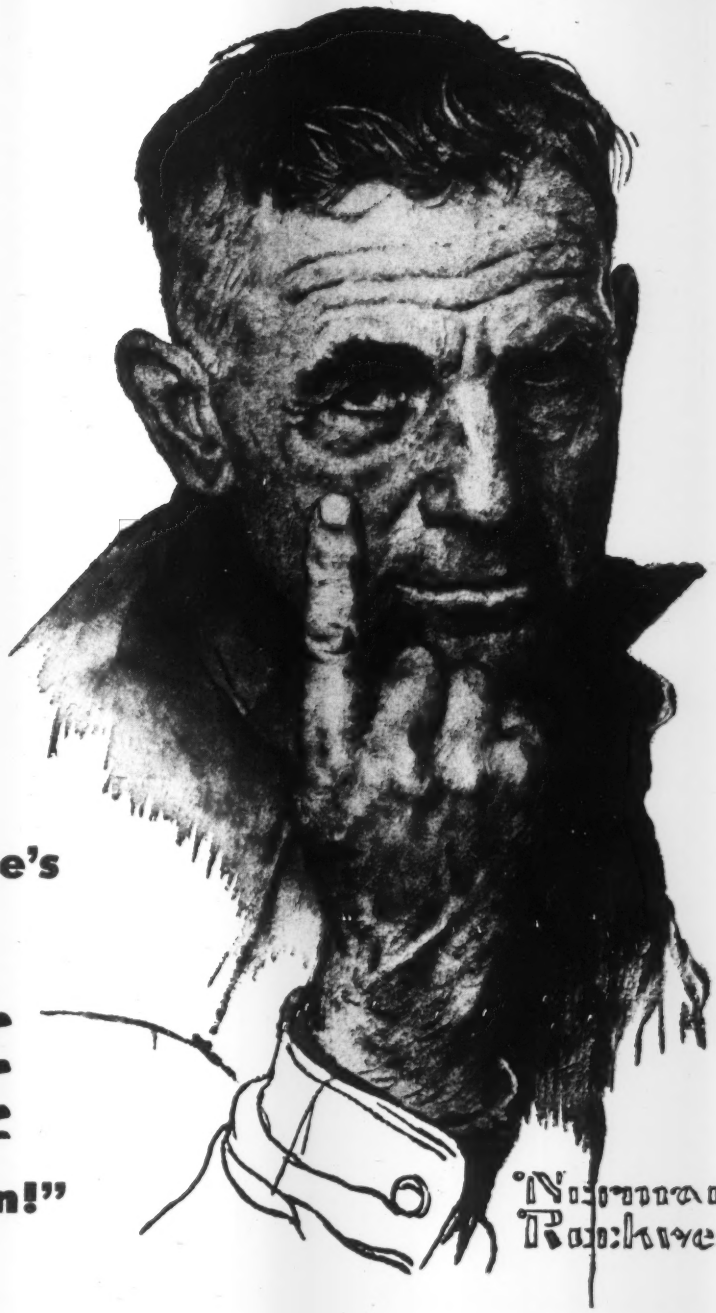
(*New Products continued on page 114*)



JEEP-MOUNTED ROTARY SNOW PLOW has a casting range of 40 to 70 ft and a loading capacity of 3 to 4 cu yds in 30 sec. The rotary blower is powered by an auxiliary 72-hp rear-mounted engine. Test reports from the manufacturer state that the plow can operate effectively in deep snows at speeds up to 20 mph. The 850-lb plow is 64 in. wide and 30 in. high and is controlled from the driver's seat. A special converter enables the plow to pile snow at the curb on streets. Brede Products Inc., 2211 Broadway N. E., Minneapolis, Minn.



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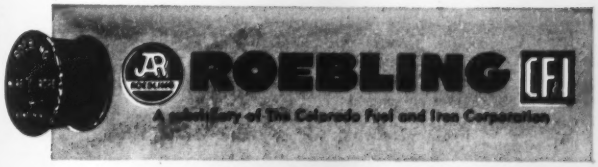

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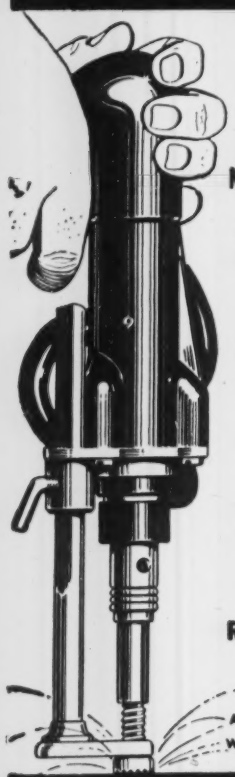

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By a gradual stripping process a new multiple compactor for macadam base and granular sub-base construction can be modified in the field to perform several tasks.

The complete machine consists of six vibratory compactors attached to a workhead that is mounted on a six-wheeled tractor. Each of the vibratory units employed normally operates at approximately 4,500 rpm, delivering 4,500 blows per minute of 1¾ tons intensity. This frequency may be varied by the operator, however, to suit the material and speed of travel. Working speeds from 0 to 60 fpm and reverse travel speeds up to 5½ mph are available.

On macadam base work, it is stated that one pass with the machine will sufficiently compact 12 in. of rock to support smooth rollers and in four passes will key and compact to final density. Further, when enough dry fines are spread on top in one application, it is claimed that it requires just two passes for the machine to fill the voids completely from top to bottom of the course.

In gravel sub-base work (blanket course—seven inches thick) at optimum moisture, the machine is said to obtain densities exceeding 100 per cent of Standard Proctor in one pass.

Standard width of the machine is 13 ft 3 in. but the separate compactor units may be removed on the job to meet conditions requiring narrower widths. Also, a handle is furnished with the machine that may be attached to one of the individual 26-in. units so that it may be used independently in manual operations.

Removal of the entire workhead leaves a mobile gas-electric power plant rated at 7½ kva and producing 110-130 volts in both three-phase and single-phase AC. JACKSON VIBRATORS, INC., LUDLINGTON, MICH.

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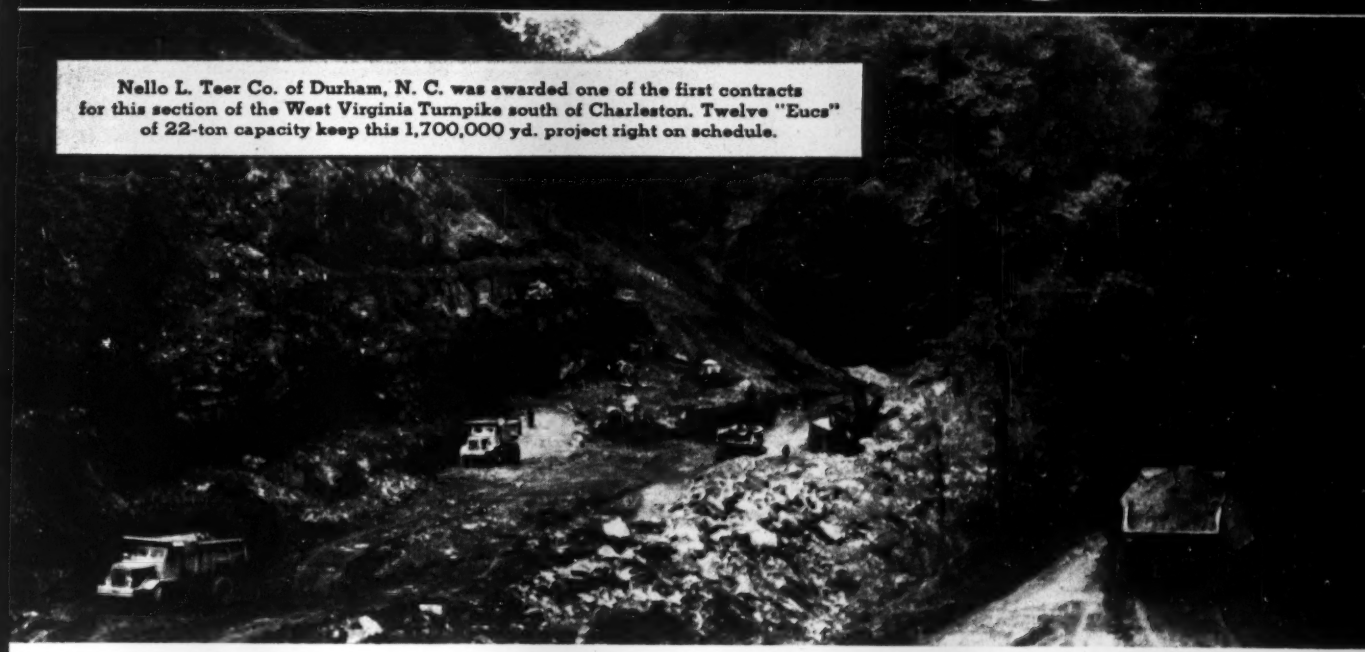
Metile is the name of a type of flooring consisting of steel plates of approximately one foot square embedded in specially installed concrete. The steel plate is so constructed that numerous anchorage points secure the plate to the concrete to prevent buckling or movement in either vertical or horizontal directions.

In laying, concrete is forced through small surface holes in the metal tiles so that islands of concrete provide an effective non-skid pattern, and serve to anchor the plates. It is claimed that the method of anchoring the tiles enables them to outperform steel sheetings of thickness running as great as ¾ in.

The Metile floors can be used for surfacing over new and old concrete, wood, wood block or brick with some variation in the basic bedment grouting course. FLASH-STONE CO., 3723 PULASKI AVE., PHILADELPHIA 40, PA.

191 "Eucs" carving out a Turnpike in West Virginia



Nello L. Teer Co. of Durham, N. C. was awarded one of the first contracts for this section of the West Virginia Turnpike south of Charleston. Twelve "Eucs" of 22-ton capacity keep this 1,700,000 yd. project right on schedule.

BUILDING the 88-mile two-lane West Virginia Turnpike is a big, mighty tough job . . . over 25 million cubic yards of excavation, mostly rock. Some of the contract sections will run up to 600,000 cu. yds. of excavation per mile due to the rugged terrain which requires deep cuts and fills as high as 120 feet.

The contractors on this rush job—scheduled for completion June 1, 1954—have been almost unanimous in their selection of Euclid equipment for this heavy grading. They know from experience that they can depend on "Eucs" to move more loads per hour at lowest cost . . . they know that "Eucs" have plenty of power to move big loads up steep grades and over the most difficult haul roads . . . and they know, too, that "Eucs" are tops for job availability when it comes to handling tough yardage.

Every day 191 "Eucs" are proving that the choice of these contractors was the right one. Your Euclid Distributor will be glad to show you why "Eucs" are your best bet for more production and more profit.

On this section "Eucs" are loaded with heavy rock and shale by shovels of 2½ yd. capacity.

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The reason? Automatic compensation for friction material wear through a unique application of the toggle lever principle. The toggles never go over center. As friction material is dissipated, their constantly increasing leverage builds up pressure in almost direct ratio to the losses sustained.

Arrangement and location of the toggles assure a uniform pressure application pattern. Every square inch of facing area engages simultaneously and in absolute parallelism. Creation of highly concentrated heat areas to cause spot burning is prevented.

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High Thermal Efficiency—because the massive plate, ribbed for rapid radiation, is cooled by positively generated air currents.

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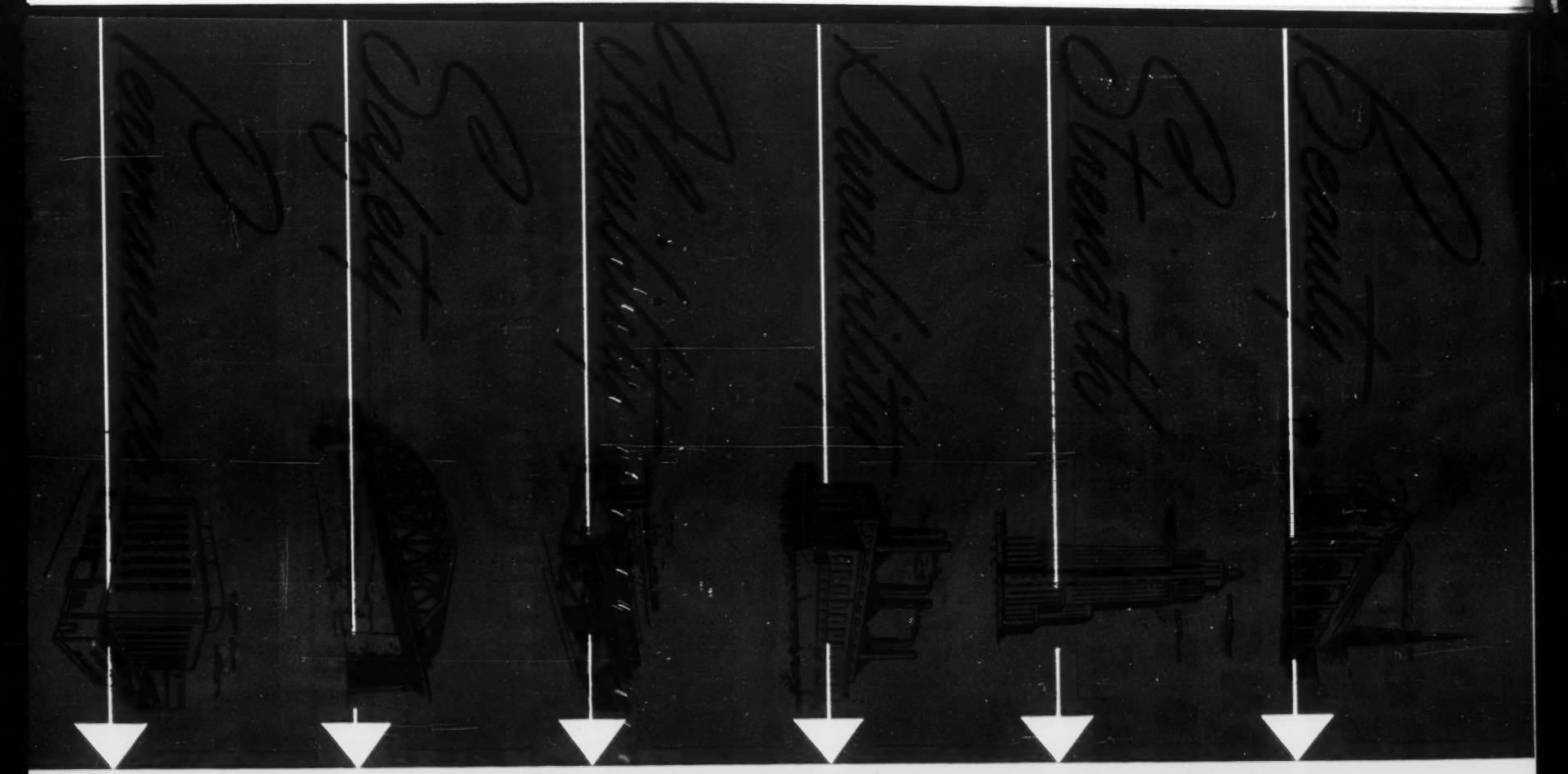
PUBLICATIONS

Pipe and pipe fabrication—Specifications for all sizes of pipe, ⅛ in. to 24 in. in diameter are included in a new catalog, titled "Pipe and Pipe Fabrication". Tables giving data and description, wall thickness, weight, etc., cover all pipe from schedule 20 through schedule 160, also standard, extra strong and double extra heavy pipe, spiral-weld pipe, large O.D. pipe in all wall thicknesses, line pipe, electric-weld tubing, welding fittings and flanges, oil well casing and water well casing. The 16-pager also describes Foster's pipe fabrication facilities for structural uses, including portable docks, sewer inlets, hand railings, stadium bleachers, road signs, portable scaffolding, street lighting poles and sprayer supports. Catalog 575C, L. B. Foster Co., 11 Park Pl., New York. 7, N. Y.

Jackbits—A new bulletin shows the complete range of Carset jackbits for use with most popular threaded connections. The bulletin gives the user a selection guide for choosing the right Carset bit for each connection and application. Write for Form 4146. Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.

Spanish translation—A Spanish translation of the Stoody Guidebook that describes how hard-facing alloys can be used in maintenance of heavy equipment is now available. It deals with manual applications of hard-facing alloys for maintenance of equipment used in mining, earthmoving, cement plants, rock products and brick and clay plants, with special emphasis on all types of crawler equipment. The booklet is available from the company's Latin American distributors, Stoody Co., Whittier, Calif.

Industrial inferential meter—An interesting booklet describes the Type MO meter. The 16-pager contains data on operation, construction, accuracy, primary devices and other general information of interest to power, process and sanitation engineers. The Type MO instrument is said to be the most accurate Venturi type meter now available, and the manufacturer claims that it provides a means of obtaining very accurate measurement of fluid flows over remarkably wide ranges. It is designed for water, sewage, sludge and industrial liquors. Bulletin No. 500 is available from the Simplex Valve & Meter Co., 68th & Upland Sts., Philadelphia 42, Pa.



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EDITORIALS

Fog on superhighways

FREQUENT CLOSING of northern sections of the New Jersey Turnpike because of fog or smoke at night and during early hours of the morning draws attention to a problem that appears to be peculiar to superhighways. It does not matter whether the superhighway be toll or free or whether it is located in Los Angeles or across the marshlands of northern New Jersey.

In New Jersey, much the same fog may lie across the old highways to which traffic is diverted when the turnpike is closed, but conditions under which drivers must operate are different. First, there are more guides that serve to indicate the boundaries of the highway ahead—more buildings, more curbed pavements, more poles, lighted gas stations, street signs and traffic lights.

Moreover, a considerable part of the traffic on the old highways is made up of local vehicles whose drivers know the road and so move steadily though cautiously. Also, because there are fewer wide lanes and more congestion, there is less tendency on the part of reckless drivers to drive at unsafe speeds. Even the headlights of cars in opposing lanes provide a guide as to where the danger lies.

On a turnpike, in contrast, fewer drivers know the route, and facing them is a wide expanse of pavement, well paved shoulders and a median zone, but with no easily distinguishable markers to indicate just where they are at the moment. When fog or smoke, or even a heavy rain, descends, drivers find it almost impossible to determine whether they are in the right-hand lane for their direction of travel, in the passing lane or on the shoulder. Where there are long deceleration or acceleration lanes at interchanges, their confusion is even greater.

Where a solution to this problem will be found is not clear. Cutting the maximum speed to 35 mph, as is being done on the New Jersey Turnpike as soon as fog or smoke appears, reduces the chance of accidents and the severity, but it does not end accidents. Reflector buttons mounted on standards at the outer edge of the shoulders also help orient the drivers, but more definite guides are needed.

Possibly more can be done with reflectorized lane marking, including the use of colored glass beads to increase the possible variations. Possibly, also, shoulders in areas subject to frequent fog should be somewhat above the pavement and separated from it by a mountable curb of scored white concrete such as is widely used for channelization at intersections. Consideration might be given to curbs that can be raised or lowered, such as are used on the Lake Shore Drive in Chicago to define the lanes for north and southbound movements during morning and evening rush hours. Also not to be overlooked are radar signal devices and light-sensitive cells.

In any event, the problem is too serious to temporize with. If no conventional device can be found to promise a solution, proposals that fall in the Buck Rogers class should at least be explored. Superhighways must be safe no matter what weather conditions prevail.

Flood-flow retardation

BY COINCIDENCE the account in this issue of what has been accomplished in the way of flood control through land treatment at the headwaters of the Trinity River in Texas comes at a time when national interest has been focused—as a result of a proposed reorganization plan—on the operations of the Soil Conservation Service, which directed the Trinity River experiment. In this case, which is one of eleven such experiments started ten years ago by the S.C.S., an indication is given for the first time of what upstream retardation can contribute to the overall flood-control program for any river.

Whenever the control of floods through the use of storage reservoirs comes up for discussion, someone is sure to propose that the ideal way to control floods is to stop them before they start by reducing the runoff from the farmers' fields. Experienced hydrologists know that that is not the complete answer, that in any major storm there is more precipitation than can be retained on the land; but they always have recognized that starting to control floods in the minor creek valleys can be of material help.

In the Trinity River Valley, quite worthwhile reductions in runoff, flood damage and soil loss through erosion are anticipated. Costs for the entire watershed, however, are going to be high, with the federal government bearing half or somewhat more under the present law, depending on local conditions. Whether the federal government should pay so large a share is, it may be noted, an issue in the current review of the whole program.

From the point of view of engineers in planning flood control on a major river system, a most important factor to consider is that runoff reduction, through methods now being employed on the Trinity River calls for full cooperation on the part of owners of the greater part of the land if it is to be effective. Neither the federal nor state government can compel a farmer to resort to contour plowing or to build farm ponds or erosion control structures. Judging by the experience of the Trinity River Improvement Association, however, practical means are available for obtaining such cooperation, so that, all in all, the prospects for more utilization of headwater control measures in overall river programs are encouraging.

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The main drive sprockets turn on four Timken bearings. These bearings must withstand heavy radial loads produced by the high engine torque. They must also take radial and thrust loads caused by the constant jolting shocks transmitted from the tracks through the sprocket. The tapered design of Timken bearings enables them to handle these radial and thrust loads with ease. And line contact between rollers and races of Timken bearings gives them the capacity for long life with trouble-free operation.

Another big advantage of the Timken bearing shows up when the TD-24 sloshes through muck and water up to the drive sprocket shaft. The Timken bearing keeps the shaft and housing concentric which means a more effective closure. The dirt stays out, the lubricant stays in.

When you buy equipment, look for Timken bearings. When you build equipment, look *into* Timken bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

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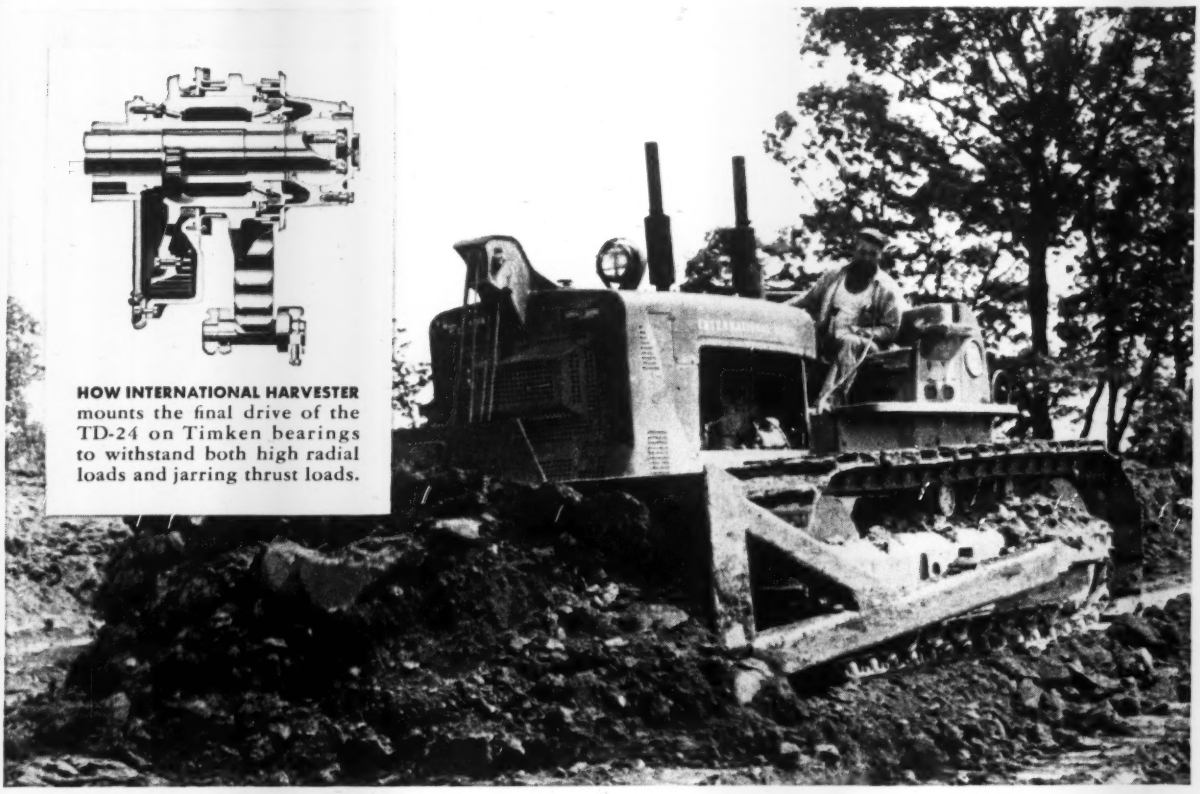

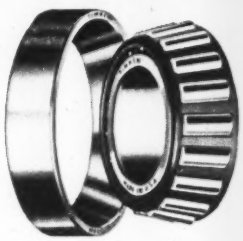

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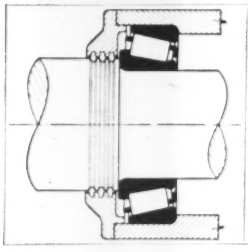

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